SOLUS™ Edge

User Manual

ZEESC320A Rev. B

Legal Information

Trademarks

Snap-on is a trademark, registered in the United States and other countries, of Snap-on Incorporated. This publication contains many Snap-on Incorporated trademarks, including but not limited to Snap-on, SOLUS Edge and SureTrack. All other marks are trademarks or registered trademarks of their respective holders.

Copyright Information

© 2015 Snap-on Incorporated. All rights reserved.

Disclaimer of Warranties and Limitation of Liabilities

All pictures and illustrations shown are for reference purposes only. All information, specifications and illustrations in this manual are based on the latest information available at the time of printing and are subject to change without notice. While the authors have taken due care in the preparation of this manual, nothing contained herein:

- Modifies or alters in any way the standard terms and conditions of the purchase, lease, or rental agreement under the terms of which the equipment to which this manual relates was acquired.
- Increases in any way the liability to the customer or to third parties.

Snap-on® reserves the right to make changes at any time without notice.

IMPORTANT:
Before operating or maintaining this unit, please read this manual carefully paying extra attention to the safety warnings and precautions.

Contact Information (North America)

Websites:

Snap-on Diagnostics and Information

- http://diagnostics.snapon.com

Software Subscription - Learn how to always have the latest diagnostic software on your diagnostic tool.

- http://diagnostics.snapon.com/theprogram

ShopStream Connect - Download free PC-based companion software used to transfer, save, manage, review, annotate, e-mail and print files saved or recorded on your Snap-on diagnostic tool.

- http://diagnostics.snapon.com/ssc

Training and Forums - Watch free instructional product videos and connect with and share your diagnostic tool questions, ideas and success stories.

- http://diagnostics.snapon.com/ForumsandTraining.htm

Manuals / Technical Documentation - The information in this manual is periodically revised to ensure the latest information is included. Download the latest version of this manual and other related technical documentation at :

- http://diagnostics.snapon.com/usermanuals

Customer Care and Technical Assistance - Phone / E- mail

1-800-424-7226 / diagnostics_support@snapon.com

For technical assistance in all other markets, contact your selling agent

Safety Information

READ ALL INSTRUCTIONS

For your own safety, the safety of others, and to prevent damage to the product and vehicles upon which it is used, it is important that all instructions and safety messages in this manual and the accompanying *Important Safety Instructions* manual be read and understood by all persons operating, or coming into contact with the product, before operating. We suggest you store a copy of each manual near the product in sight of the operator.

For your safety, read all instructions. Use your diagnostic tools only as described in the tool user's manual. Use only manufacturer recommended parts and accessories with your diagnostic tools.

This product is intended for use by properly trained and skilled professional automotive technicians. The safety messages presented throughout this manual and the accompanying *Important Safety Instructions* manual are reminders to the operator to exercise extreme care when using this product.

There are many variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the individual doing the work. Because of the vast number of test applications and variations in the products that can be tested with this instrument, we cannot possibly anticipate or provide advice or safety messages to cover every situation. It is the responsibility of the automotive technician to be knowledgeable of the system being tested. It is essential to use proper service methods and test procedures. It is important to perform tests in an appropriate and acceptable manner that does not endanger your safety, the safety of others in the work area, the equipment being used, or the vehicle being tested.

It is assumed that the operator has a thorough understanding of vehicle systems before using this product. Understanding of these system principles and operating theories is necessary for competent, safe and accurate use of this instrument.

Before using the equipment, always refer to and follow the safety messages and applicable test procedures provided by the manufacturer of the vehicle or equipment being tested. Use the product only as described in it's user manual. Use only manufacturer recommended parts and accessories with your product.

Read, understand and follow all safety messages and instructions in this manual, the accompanying *Important Safety Instructions* manual, and on the test equipment.

Environmental Conditions:

- This product is intended for indoor use only
- This product is rated for Pollution Degree 2 (normal conditions)

Safety Signal Words

All safety messages contain a safety signal word that indicates the level of the hazard. An icon, when present, gives a graphical description of the hazard. Safety Signal words are.

⚠ DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or to bystanders.

⚠ WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or to bystanders.

⚠ CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor injury to the operator or to bystanders.

Safety Message Conventions

Safety messages are provided to help prevent personal injury and equipment damage. Safety messages communicate the hazard, hazard avoidance and possible consequences using three different type styles:

- Normal type states the hazard.
- **Bold type states how to avoid the hazard.**
- *Italic type states the possible consequences of not avoiding the hazard.*

An icon, when present, gives a graphical description of the potential hazard.

Safety Message Example

⚠ WARNING

Risk of unexpected vehicle movement.

- **Block drive wheels before performing a test with engine running.**

A moving vehicle can cause injury.

Important Safety Instructions

For a complete list of safety messages, refer to the accompanying *Important Safety Instructions manual*.

SAVE THESE INSTRUCTIONS

Contents

Safety Information ..... **ii**

Chapter 1: Using This Manual **3**
Content 3
Conventions 3
Terminology 3
Symbols 3
Bold Text 4
Notes and Important Messages 4
Hyperlinks 4
Procedures 4

Chapter 2: Introduction **5**
Control Buttons 5
Data and Power Connections 6
Battery Pack and Stand 7
Power Sources 8
Internal Battery Pack 8
AC/DC Power Supply 8
Vehicle Power 8
Technical Specifications 9

Chapter 3: Basic Operation and Navigation **10**
Turning On/Off and Emergency Shutdown 10
Turning On 10
Turning Off 10
Emergency Shutdown 11
Basic Navigation 11
Home Screen Layout 11
Title Bar 12
Home Screen Icons 13
Common Toolbar Control Icons 14
Scroll Bar 15
Screen Messages 16
System Messages 16
Communication Messages 16
Data Cable Connection 17

Chapter 4: Scanner **18**
Screen Layout and Toolbar Icons 18
Screen Layout 18
Scanner Control Icons 19
Scanner Demonstration Program 19
Scanner Operation 20
Vehicle Identification 20

Connecting the Data Cable 21
System and Test Selection 22
Exiting Scanner 38
SureTrack 38
SureTrack Operation 38
Wi-Fi Setup and Testing 43
Testing 44
SureTrack Troubleshooting 47

Chapter 5: OBD-II/EOBD 50
Basic Operations 50
Screen Layout and Toolbar Controls 50
Connecting the Data Cable 50
Saving and Reviewing Data Files 50
OBD-II/EOBD Menu 50
OBD Health Check 51
OBD Direct 53

Chapter 6: Previous Vehicles and Data 60
Previous Vehicles and Data Menu 60
Vehicle History 60
View Saved Data 61
Delete Saved Data 62

Chapter 7: Tools 63
Tools Menu 63
Connect-to-PC 64
Configure Shortcut Button 64
System Information 65
Settings 65

Chapter 8: Maintenance 73
Cleaning and Inspecting the Diagnostic Tool 73
Cleaning the Touch Screen 73
Battery Pack Service 73
Battery Pack Safety Guidelines 74
Replacing the Battery Pack 75
Disposing of the Battery Pack 76

Index 77

Chapter 1 Using This Manual

1.1 Content

This manual contains basic operating instructions and is structured in a manner to help you become familiar with your diagnostic tool features and perform basic operations.

The illustrations in this manual are intended as reference only and may not depict actual screen results, information, functions or standard equipment. Contact your sales representative for availability of other functions and optional equipment.

1.2 Conventions

The following conventions are used.

1.2.1 Terminology

The terms “Scanner” and “Scanner function” are used to describe the Scanner Function(s) of the diagnostic tool.

Examples:

- Select **Scanner** from the Home screen.
- From the Scanner main menu select **Continue**.
- The Scanner function provides many diagnostic tests.

The term “select” describes tapping/touching an icon on the touch screen, or highlighting an icon or menu choice and then selecting the confirmation menu choice such as **Continue, Accept**, **OK**, **Yes, or other similar** choice.

Abbreviated example for the following procedure: “Select **Brightness**”

1. Navigate to and highlight the **Brightness** selection.
2. Select **OK, or similar,** button.

1.2.2 Symbols

Different types of arrows are used. The “greater than” arrow (**>**) indicates an abbreviated set of selection (navigation) instructions.

Abbreviated example for the following procedure: “Select **Tools > Connect-to-PC**”

1. Select **Tools** from the home screen.
2. Highlight **Connect-to-PC** on the Tools menu.
3. Select **Connect-to-PC**.

The solid arrows (◄, ►, ▼, ▲) are navigational instructions for the four directions of the directional buttons.

Example: Press the down ▼ arrow.

1.2.3 Bold Text

Bold emphasis is used in procedures to highlight selectable items such as control buttons, icons and menu options.

Example: Press the **OK** button

1.2.4 Notes and Important Messages

The following messages are used.

Notes

A NOTE provides helpful information such as additional explanations, tips, and comments.

Example:

NOTE:
For additional information refer to...

Important

IMPORTANT indicates a situation which, if not avoided, may result in damage to the test equipment or vehicle.

Example:

IMPORTANT:
Do not disconnect the data cable while the diagnostic tool is communicating with the ECM.

1.2.5 Hyperlinks

Hyperlinks, or hot links, that take you to other related articles, procedures, and illustrations are available in electronic documents. Blue colored text indicates a selectable hyperlink.

Example:

IMPORTANT:
Read all applicable Safety Information before using this diagnostic tool!

1.2.6 Procedures

An arrow icon in the left-margin area indicates a procedure.

Example:

To change screen views:

1. Select the **Graph** icon.
   The dropdown menu displays.
2. Select an option from the menu.
   The screen layout changes to the format selected.

Chapter 2 Introduction

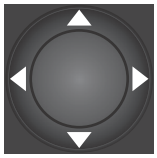
This chapter introduces the basic features of the diagnostic tool, including the control buttons, data connections, battery pack and power sources. Technical Specifications are provided at the end of this chapter.

2.1 Control Buttons

There are four “push type” control buttons and one “thumb pad rocker type” multi-directional button located on the right side of the diagnostic tool. All other diagnostic tool operations are controlled through the touch screen.

Figure 2-1 *Front view*

Item	Button	Description	
1		**N/X or Cancel** - Push type button	• To exit a menu or program. • To close an open list and return to the previous menu or screen. • To answer “No” when a yes/no choice is given.
2		**Y/✓ or Accept** - Push type button	• To confirm a selection from a menu or program • To select an item that was highlighted using the direction arrows. • To advance to the next screen in a series. • To answer “Yes” when a yes or no choice is given.

Item	Button	Description	
3		**Directional** - Thumb pad rocker type buttons	Buttons move the cursor or highlight in their respective direction: • Up (▲) • Down (▼) • Left (◀) • Right (▶)
4		**S (Shortcut)** - Push type button	Programmable function button that can provide a shortcut for performing a variety of routine tasks. Refer to Configure Shortcut Button, on page 64 for additional information.
5		**Power (On/Off)** - Push type button	Turns the diagnostic tool on and off. Also, press and hold for 5 seconds for emergency shutdown

2.2 Data and Power Connections

Connectors and jacks for data communication cables and the AC/DC Power Supply are located on the top of the diagnostic tool.

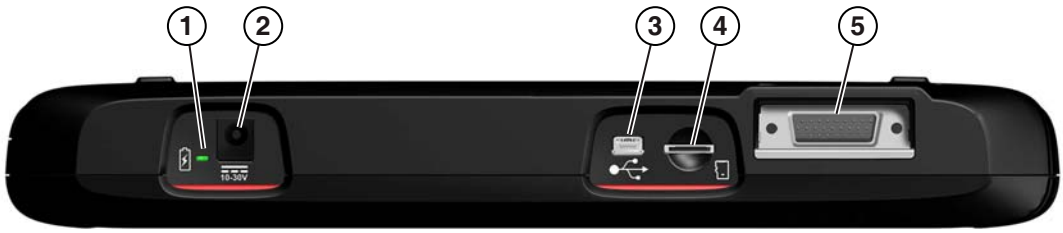


Figure 2-2 *Top view*

Item	Description
1	**Battery Status Indicator LED** • Green - battery is fully charged • Red - battery is charging • Amber - indicates a battery issue
2	**DC Power Supply Jack** - AC/DC power supply connection
3	**Mini USB Jack** - USB cable connection used to transfer saved data files to a personal computer
4	**Micro secure digital (uSD) Card** - contains operating system programming. ***IMPORTANT The uSD card must be installed for the diagnostic tool to operate. Do not remove the uSD card while the diagnostic tool is powered on.***
5	**Data Cable Connector** - Data cable connection used to connect the diagnostic tool to a vehicle data link connector

2.3 Battery Pack and Stand

1— Battery Pack

2— Battery Cover

3— Built in-Stand (shown open) - The built-in stand extends from the back of the diagnostic tool and clips into the diagnostic tool for storage.

Figure 2-3 *Back view*

2.4 Power Sources

Your diagnostic tool can receive power from any of the following sources:

- Internal Battery Pack
- AC/DC Power Supply
- Vehicle Power

2.4.1 Internal Battery Pack

The diagnostic tool can be powered from the internal rechargeable battery pack. A fully charged battery provides sufficient power for about 3.5 hours of continuous operation.

The battery is recharged when an external power source is connected. Battery charging occurs when the diagnostic tool is connected to a vehicle data link connector (DLC) using the Data Cable or when the AC/DC Power Supply is connected to a live AC power source.

The Battery Status Indicator LED (located next to the DC power supply jack) indicates battery status (Figure 2-3).

- **Green** - indicates battery is fully charged
- **Red** - indicates battery is charging
- **Amber** - indicates a battery issue. This is usually caused by excessive battery temperature (above 104°F/40°C), which disables charging. Allow the diagnostic tool to cool down be continuing operation.

2.4.2 AC/DC Power Supply

The diagnostic tool can be powered from a standard AC outlet using the AC/DC power supply. The connector on the end of the output cable of the AC/DC power supply attaches to the DC power supply input jack on top of the diagnostic tool. Use only the AC/DC power supply provided.

IMPORTANT:
Never connect the AC/DC power supply to the DC power supply input on the diagnostic tool when the diagnostic tool is communicating with a vehicle.

2.4.3 Vehicle Power

All OBD-II/EOBD vehicles have vehicle battery power (B+) available on the DLC. The diagnostic tool is powered through the Data Cable when connected to the vehicle DLC. A green LED indicator on the DLC end of the data cable, illuminates when power is being supplied to the cable. If the LED fails to illuminate, check that the data cable is properly connected and then check the DLC power circuit. See Data Cable Connection, on page 17 for additional data cable information.

An optional power cable is required when testing non-OBD-II/EOBD models that do not have vehicle battery power (B+) available on the DLC. Contact your sales representative for availability.

IMPORTANT:
Never connect the optional power cable to the DC power supply input on the diagnostic tool when the diagnostic tool is communicating with a vehicle.

2.5 Technical Specifications

Item	Description / Specification
Touch Screen	Resistive Touch Panel
Display	8.0 inch diagonal, Color LCD
	800 x 480 resolution SWVGA
Battery	Rechargeable lithium-ion battery pack
	Approximately 3.5 hour run time
	Approximately 5 hour charge time
DC Jack Operating Voltage	10 to 30VDC
Width	11.1 in. (281 mm)
Height	6.3 in. (160 mm)
Depth	1.6 in. (40.3 mm)
Weight (including battery):	2.6 lb (1.18 kg)
Operating Temperature Range (ambient)	At 0 to 90% relative humidity (non-condensing) 32 to 113°F (0 to 45°C)
Storage Temperature (ambient)	At 0 to 70% relative humidity (non-condensing) –4 to 140°F (–20 to 60°C)
Environmental Conditions	This product is intended for indoor use only
	This product is rated for Pollution Degree 2 (normal conditions)
Power Supply	Supply Rating; 15 VDC, 2A

Chapter 3 Basic Operation and Navigation

This chapter describes basic diagnostic tool operation, navigation, screen layout, icon functions, and screen messages. Before you operate the diagnostic tool, make sure the battery pack is fully charged or the diagnostic tool is powered by the AC power supply.

3.1 Turning On/Off and Emergency Shutdown

The following sections describe how to turn the diagnostic tool on and off and how to perform an emergency shutdown.

3.1.1 Turning On

The diagnostic tool will automatically turn on and open the Home screen (Figure 3-1) when power is supplied through the Data Cable or by the AC/DC Power Supply. If the diagnostic tool does not automatically turn on, press and release the Power button on the front of the diagnostic tool to turn the diagnostic tool on.

3.1.2 Turning Off

IMPORTANT:
All vehicle communication must be terminated **BEFORE** turning off the diagnostic tool. A warning message displays if you attempt to turn the diagnostic tool off while communicating with the vehicle. Forcing a shut down while communicating may lead to ECM problems on some vehicles. Never disconnect the Data Cable when the diagnostic tool is communicating with the vehicle ECM.

To turn off the diagnostic tool:

1. Press the **N/X** button or select the **Back** or **Home** icon to navigate to the Home screen.
   The “stopping communication” message appears briefly before the Home screen displays.
2. Disconnect the diagnostic tool Data Cable from the vehicle.
3. Press and release the **Power** button.
   A confirmation screen displays.
4. Press the **Y/✓** button or select **OK** from the menu to turn the diagnostic tool off. To continue operating, press the **N/X** button or select **Cancel** from the menu.

3.1.3 Emergency Shutdown

IMPORTANT:
Using the emergency shutdown procedure while communicating with the vehicle ECM may lead to ECM problems on some vehicles.

During normal operation turn the diagnostic tool off using the *Turning Off* procedure above. The emergency shutdown procedure should only be used If the diagnostic tool does not respond to navigation or control buttons or exhibits erratic operation. To force an emergency shutdown, press and hold the **Power** button for five seconds until the diagnostic tool turns off.

3.2 Basic Navigation

3.2.1 Home Screen Layout

The Home screen includes a title bar and main body. The Home screen contains icons, one for each of the primary diagnostic tool functions.

1— Title Bar
2— Main Body

Figure 3-1 *Home screen*

3.2.2 Title Bar

The title bar at the top of the screen provides basic information about current diagnostic tool operating conditions. Title bar options vary depending upon vehicle make and model, what function is active, what test is being performed, or what menu is selected. The title bar contains information only, there are no selectable items.

Elements of the Title bar let you know at a glance:

- What diagnostic tool function is currently active.
- The current time.
- Wi-Fi signal strength
- The source and status of the power being supplied to the diagnostic tool.

An active function icon is always displayed along the left-hand edge of the Title bar. These icons resemble their Home screen icon counterparts in appearance and color. The name of the function displays to the right of the icon on some screens.

A real time clock displays to the left of the power supply icon. The clock is powered by a dedicated internal battery, so the correct time is maintained even when the main battery pack is discharged. Use the Tools function to set the clock and format how time is displayed. See Clock Settings, on page 70 for additional information.

The Title bar displays other information that varies depending upon what functions are being performed. Other information may include:

- The identification (ID) of the test vehicle
- The name of the active menu or function
- The name of the test being performed

Table 3-1 *Title Bar Icons*

Icon	Function	Icon	Function
	Full Battery Charge Level - Indicates power is being supplied by the internal battery pack. Horizontal bars diminish as the battery discharges.		**Active Vehicle Communication -** Indicates the diagnostic tool is actively communicating with a vehicle.
	Low Battery Charge Level - Indicates the internal battery pack is low and needs to be recharged immediately. A warning message will also display on the screen when the battery gets low.		**Wi-Fi Signal Strength -** Indicates signal strength of the wireless network connection. Three bars - indicate full strength signal Zero to 1 bar - indicate weak or no signal
	External Power Connected - Indicates power is being supplied through the data cable connection to a vehicle or by the AC/DC Power Supply.		

3.2.3 Home Screen Icons

Each available diagnostic tool function is represented by a icon on the home screen. The table below provides descriptions of the icon functions.

Select an icon from the Home screen to launch a function. You can also use the control buttons to activate a function, a yellow border around the icon indicates it is highlighted, or in focus. Use the Directional buttons (◄, ►, ▲, ▼) to highlight the desired function and then press the **Y/✓** button to select it. A “please wait” message may display briefly, then automatically clear once the function is loaded and ready for use.

Table 3-2 *Home screen icons*

Function Name	Function Icon	Description
Scanner		Used to communicate with the electronic control systems of a vehicle. This function allows you to retrieve diagnostic trouble codes (DTCs), view PID data and perform diagnostic tests. See Scanner, on page 18 for details.
OBD-II/EOBD		Allows you to access generic OBD-II/EOBD data and tests without identifying the vehicle being tested. See OBD-II/ EOBD, on page 50 for details.
Previous Vehicle & Data		Allows you to quickly reconfigure the diagnostic tool to a recently tested vehicle and to access saved data files.See Previous Vehicles and Data, on page 60 for details.
Tools		Allows you to adjust diagnostic tool settings to your personal preferences and perform other special functions. See Tools, on page 63 for details.

3.2.4 Common Toolbar Control Icons

Common control icon functions are described in the following table. Specific function control icons are described in their applicable chapters. Displayed control icons vary depending on the active function or test. Select a control icon on a screen to activate a control function. You can also use the control buttons to activate a function, a yellow border around the icon indicates it is highlighted, or in focus. Use the Directional buttons (◄, ►, ▲, ▼) to highlight the desired function and then press the **Y/✓** button to select it.

Icon	Function	Icon	Function
	Back - Returns to the previously viewed screen. Icon is located on the left-hand edge of the toolbar.		**Record** - Indicates the data being displayed is paused and not being updated. Selecting resumes data collection.
	Home - Returns to the Home screen. Icon is located next to the Back icon on the left side of the toolbar.		**Tools** - Opens the tools menu.
	Save - Writes data from buffer memory to a file. The saved "movie" file can be accessed for future reference by selecting **Previous Vehicles and Data > View Saved Data**.		
The control icons below are used to navigate through paused or saved "movie" files during playback.			
	Step Forward - allows forward movement in singular steps. To quickly step forward, select this icon (yellow frame appears) then press and hold the Y/✓ button. (**Note:** To quickly step forward during Scanner data playback, press and hold the icon down until a red frame appears around the icon.)		**Step Back** - allows backward movement in singular steps. To quickly step backward, select this icon (yellow frame appears) then press and hold the Y/✓ button. (**Note:** To quickly step backward during Scanner data playback, press and hold the icon down until a red frame appears around the icon.)
	Skip Forward - allows forward movement in multiple steps. To quickly skip forward, select this icon (yellow frame appears around icon) then press and hold the Y/✓ button		**Skip Back** - allows backward movement in multiple steps. To quickly skip backward, select this icon (yellow frame appears around icon) then press and hold the Y/✓ button.

3.2.5 Scroll Bar

A vertical scroll bar appears along the right-hand edge of the screen when additional data expands above or below what is currently on the screen (Figure 3-2).

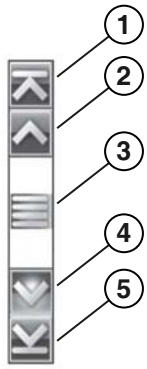


Figure 3-2 *Scroll bar*

1— Beginning - Moves to beginning of data displayed

2— Step up - Moves up one increment of the data displayed

3— Slider (position indicator) - Select and drag the **Slider** to scroll through data. The slider indicates the relative position of the current screen to the total available data.

4— Step down - Moves down one increment of the data displayed

5— End - Moves to end of data displayed

The Up (▲) and Down (▼) directional buttons can also be used to move through the data one line at a time. Press and hold a directional button to rapidly scroll through data.

3.3 Screen Messages

3.3.1 System Messages

There are four types of system messages that may be displayed:

Message Type	Description
Loading and Connecting	Loading and connecting messages display when the diagnostic tool is performing an internal operation, such as loading a database, establishing communications with the vehicle, or initiating a test. The message automatically clears once the internal operation is complete.
Confirmation	Confirmation messages inform you when you are about to perform an action that cannot be reversed or when an action has been initiated that requires a confirmation to continue.When a response is not required, the message displays briefly, then disappears.
Warning	Warning messages inform you when completing the selected action may result in an irreversible change or in the loss of data. A confirmation is required to continue
Error	Error messages inform you when a system or procedural error has occurred, for example if the data cable becomes disconnected during operation.

3.3.2 Communication Messages

When “no communication” messages are displayed, it indicates the diagnostic tool and the vehicle electronic control module are not communicating.

The following conditions cause “no communication” messages to display:

- The diagnostic tool is unable to establish a communication link with the vehicle.
- The vehicle is not equipped with the system that was selected.
- There is a loose connection.
- There is a blown vehicle fuse.
- There is a wiring fault on the vehicle.
- There is a circuit fault in the data cable or adapter.
- Incorrect vehicle identification was entered.

Refer to the Vehicle Communication Software manuals for manufacturer-specific problems.

3.4 Data Cable Connection

Connection of the data cable to the diagnostic tool and vehicle DLC is required for Scanner and OBD-II/EOBD testing.

Depending on the vehicle, the supplied DA-4 data cable may be used alone or may require optional adapters.

- **All OBD-II/EOBD compliant vehicles** - Use the supplied DA-4 data cable. The 26-pin end of the cable attaches to the data cable connector on the top of the diagnostic tool. The16-pin end connects to the vehicle DLC. The cable connectors are secured with captive screws.
- **All non-OBD-II/EOBD (OBD-I) compliant vehicles** - Use the supplied DA-4 data cable with the optional DA-5 adapter and a manufacturer specific adapter. The 26-pin end of the cable attaches to the data cable connector on the top of the diagnostic tool. The16-pin end connects to the DA-5 adapter, the DA-5 adapter connects to the manufacturer specific adapter and then connects to the vehicle DLC. The cable connectors are secured with captive screws.

On-screen cable and adapter connection instructions are provided while using the Scanner and OBD-II/EOBD functions. The instructions may also include the location of the vehicle DLC (Figure 3-3). If required, additional connection information can be found in the appropriate vehicle communication software manual for the vehicle. Vehicle communication software manuals are available online, see the website information at the front of this manual

Figure 3-3 *Vehicle connection data cable message*

For data cable vehicle power connection information, see Vehicle Power, on page 8.

To connect the data cable to the vehicle:

1. Follow the on-screen instructions for connecting to the vehicle (Figure 3-3).
2. Select **Continue** once the data cable is connected.

   The diagnostic tool establishes communication then displays a list of available tests. If the diagnostic tool is unable to establish a communications link, a “no communications” message displays.
3. Select from the available tests to open a submenu of test options.

Chapter 4 Scanner

This chapter describes the basic operation of the Scanner function.

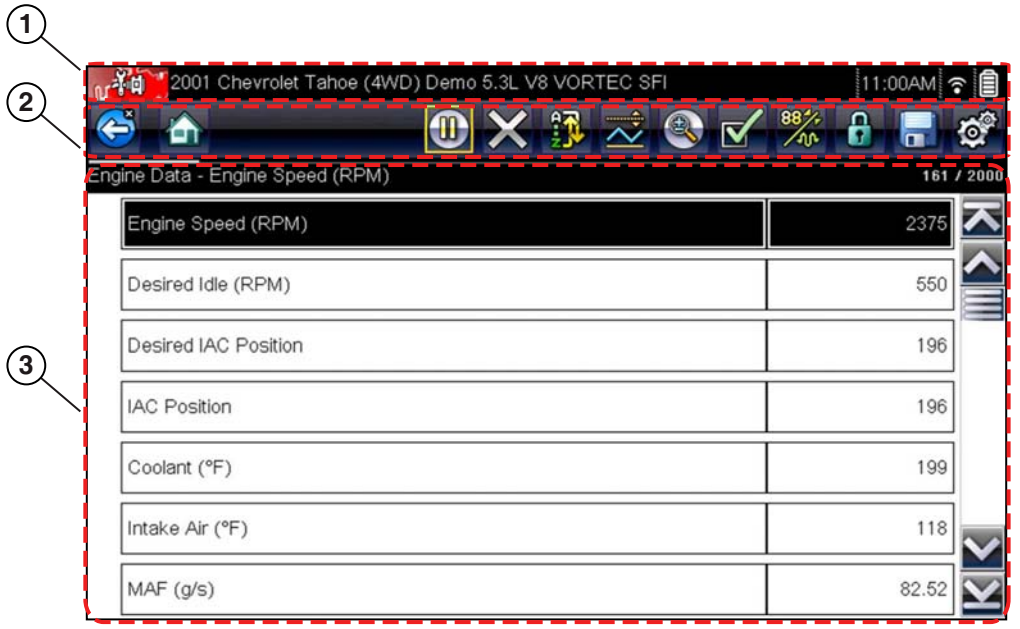
The **Scanner** icon is located on the Home screen.

The Scanner function allows your diagnostic tool to communicate with the electronic control systems of a vehicle. This allows you to retrieve diagnostic trouble codes (DTCs), view PID data and perform diagnostic tests.

4.1 Screen Layout and Toolbar Icons

The following screen layout and toolbar controls apply to both the Scanner and the OBD-II/EOBD functions.

4.1.1 Screen Layout



1— Title bar—shows active test, vehicle and diagnostic tool status

2— Toolbar—contains control icons

3— Main body—displays menus, PID and test data

Figure 4-1 *Screen layout*

The Title bar appears for all functions and displays information only, there are no selectable items. Refer to Title Bar, on page 12 for details.

4.1.2 Scanner Control Icons

The scanner toolbar contains control icons. Control icons may vary depending on the active function or test. A yellow frame surrounding an icon (highlighted), indicates it is selected. Other control icons (not shown) are described in Common Toolbar Control Icons, on page 14.

Icon	Function	Icon	Function
	Pause - Indicates PID data from the vehicle is being displayed. Selecting pauses data collection.		**Custom Data List** - Opens a menu for selecting which PIDs display in the list.
	Clear - Erases all the PID data in the buffer and begins a new recording. Selecting opens a confirmation message.		**Change View** - Changes display options between PID list or graph displays.
	Trigger - Opens a menu that allows you to set, arm, and clear threshold values that automatically trigger PID data to be saved from buffer memory to a file.		**Lock/Unlock** - Locks or unlocks the highlighted parameter. Locked PIDs move to the top of the list and do not scroll as you move through the data.
	Zoom - Incrementally increases and decreases the scale of the data being displayed.		**Sort** - Determines the order in which PIDs are listed on the screen.

4.2 Scanner Demonstration Program

The Scanner demonstration program contains actual ECM PID data that allows you to navigate and become familiar with the many capabilities of the Scanner function without actually connecting to a vehicle. The following sections in this chapter provide detailed information on navigating through the Scanner function and various menus. As you navigate through the Demonstration program, refer to the applicable section for additional information.

To start the demonstration program:

1. From the Home screen, select the **Scanner** icon.
   The manufacturer menu displays.
2. Select the **Demonstration** icon.

IMPORTANT:
Do not connect a vehicle to the diagnostic tool while using the Demonstration program.

3. Follow the on-screen instructions and make the selection as needed until the confirmation screen displays.
4. Select **OK** on the confirmation screen to load the demonstration database.
   A message displays “Demo mode: Do not connect to vehicle.”
5. Select **Continue**.
   A systems menu, which shows all of the systems available for testing, displays.
6. Select a system from the menu, then select submenus as applicable to display the desired demonstration information.

4.3 Scanner Operation

Launching Scanner opens a menu list of vehicle manufacturers and begins the process by identifying the vehicle being tested. After the vehicle is identified, a vehicle system is selected and then a specific test or function is selected to allow you to retrieve diagnostic trouble codes (DTCs), view and save PID data, or perform diagnostic tests.

Basic Scanner Testing Procedure

1. **Launch Scanner**—Select the **Scanner** icon on the Home screen.
2. **Identify the vehicle**—Identify the test vehicle by selecting from the menu options.
3. **Connect the data cable to the vehicle**—Follow the on-screen connection instructions to connect the diagnostic tool to the test vehicle.
4. **Select the system**—Select the system to be tested from the systems menu.
5. **Select the test from the main menu**—Select the desired test.

4.3.1 Vehicle Identification

The diagnostic tool displays PID data provided by the vehicle ECM. The vehicle must be correctly identified for the diagnostic tool to communicate and display PID data correctly. The vehicle identification sequence is menu driven, follow the screen prompts to enter the information. Exact procedures may vary by the make, model, and year of the vehicle.

To identify a vehicle for testing:

1. Select the **Scanner** icon on the Home screen.
   A list of manufacturers displays (Figure 4-2).

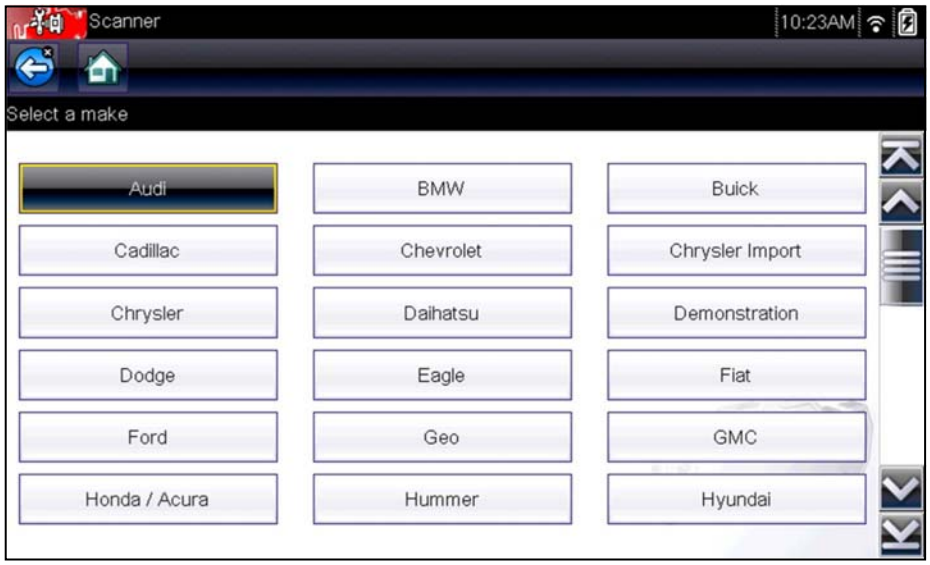


Figure 4-2 *Manufacturer list*

The list includes Demonstration, which opens the Demonstration program (see Scanner Demonstration Program, on page 19).

2. Select the vehicle manufacturer from the list.

   A model year menu displays.

3. Select the vehicle year from the menu.

   A list of vehicle types or models displays. Several selections may be required to complete the vehicle identification, follow the screen prompts to enter the required information.

   A confirmation screen displays once all the required information has been entered (Figure 4-3).

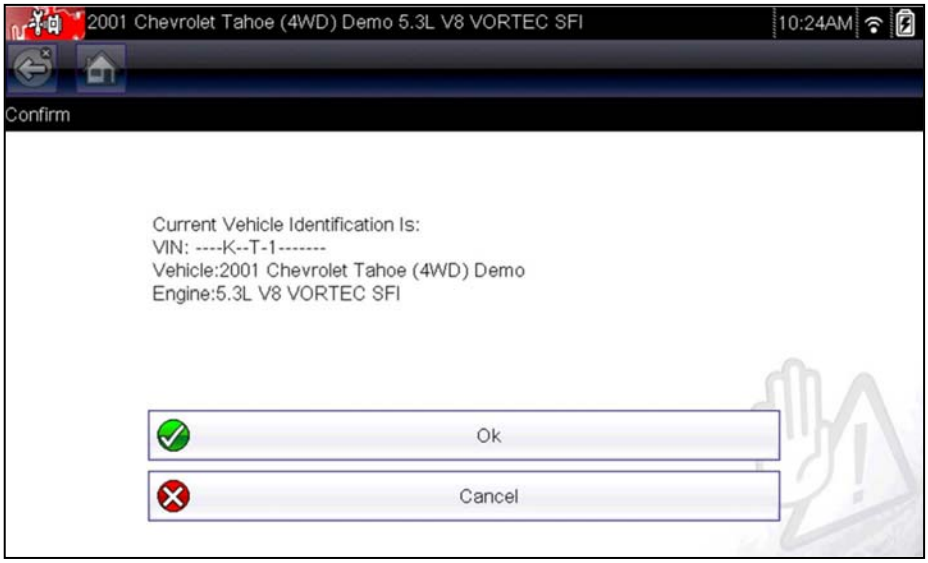


Figure 4-3 *Vehicle confirmation screen*

4. From the Confirm Vehicle screen select:
   a. **OK** to continue.
   b. **Cancel** to return to the previous screen.

4.3.2 Connecting the Data Cable

Connection of the data cable to the diagnostic tool and vehicle DLC is required for Scanner testing, see Data Cable Connection, on page 17.

4.3.3 System and Test Selection

After a vehicle is selected, a menu of available systems is displayed. Select a system to continue.

Figure 4-4 *Available systems list*

NOTE:
Only the systems available for testing on the identified vehicle are included in the list.

After a system is selected and the diagnostic tool establishes communication with the vehicle, a menu, of available tests is displayed.

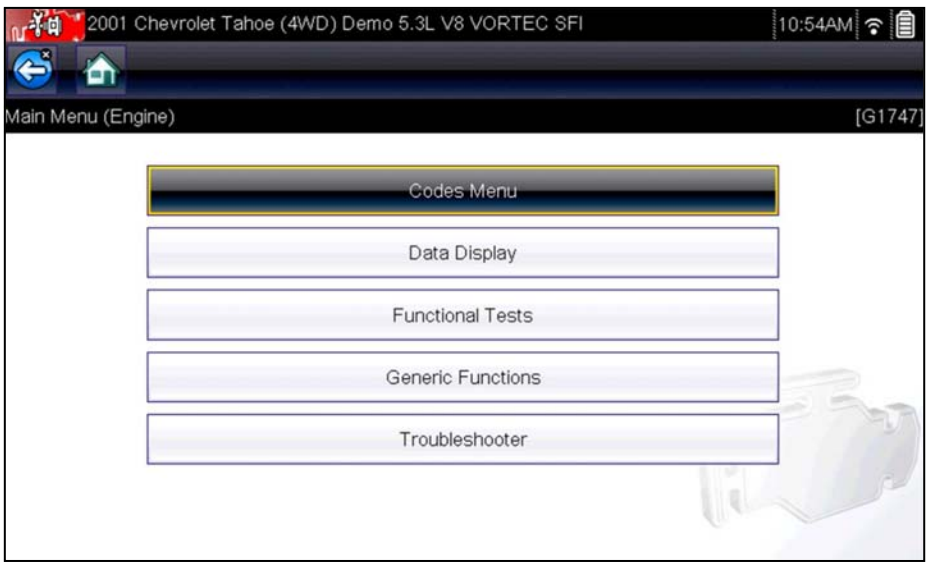


Figure 4-5 *Main menu*

Main menu options vary slightly by the year, make, and model of the test vehicle. The main menu may include:

- **Codes Menu**—displays diagnostic trouble code (DTC) records from the vehicle electronic control module. Selecting may open a submenu of viewing options.
- **Clear Codes**—erases DTC records and other data from the ECM. This selection is found on a Codes submenu for some models.
- **Data Display**— displays PID data from the vehicle electronic control module. Selecting may open a submenu of viewing options.
- **Functional Tests**—provides specific subsystem tests. The tests vary depending on the manufacturer and model.
- **Actuator Tests**—similar to functional tests, checks the operation of certain actuators, such as solenoid valves and relays.
- **Memory Resets**—allows you to reprogram adaptive values for certain components after making repairs. Selecting opens a submenu. These options are found on the Functional Tests Menu for some models.
- **System Tests**—provides specific subsystem testing. Performing these tests is similar to functional tests.
- **Generic Functions**—lets you access certain available Generic OBD II functions from a proprietary menu (1996 and newer vehicles only).
- **Troubleshooter**—provides step-by-step procedures, integrating PIDs and retrieving trouble codes when appropriate, for specific symptoms of the identified vehicle.

Codes Menu

This selection may appear as Codes, Codes Menu, Codes Only, Codes (No Data), Service Codes or something similar on the menu. Selecting opens a list of viewing options that includes:

- Display Codes
- Clear Codes, on page 26
- Freeze Frame/Failure Records, on page 26
- DTC Status, on page 27

Display Codes

This function opens either a list of diagnostic trouble codes (DTCs) stored in the selected vehicle electronic control module (ECM), or a submenu of DTC viewing options. The code list includes the DTC and a brief description (Figure 4-6).

If SureTrack® (optional) is active and data is available for a selected DTC, additional troubleshooting information from SureTrack (e.g. Common Replaced Parts data (Figure 4-6), Real Fix and Related Fixes) will also be available. For additional information about using SureTrack, see SureTrack, on page 38.

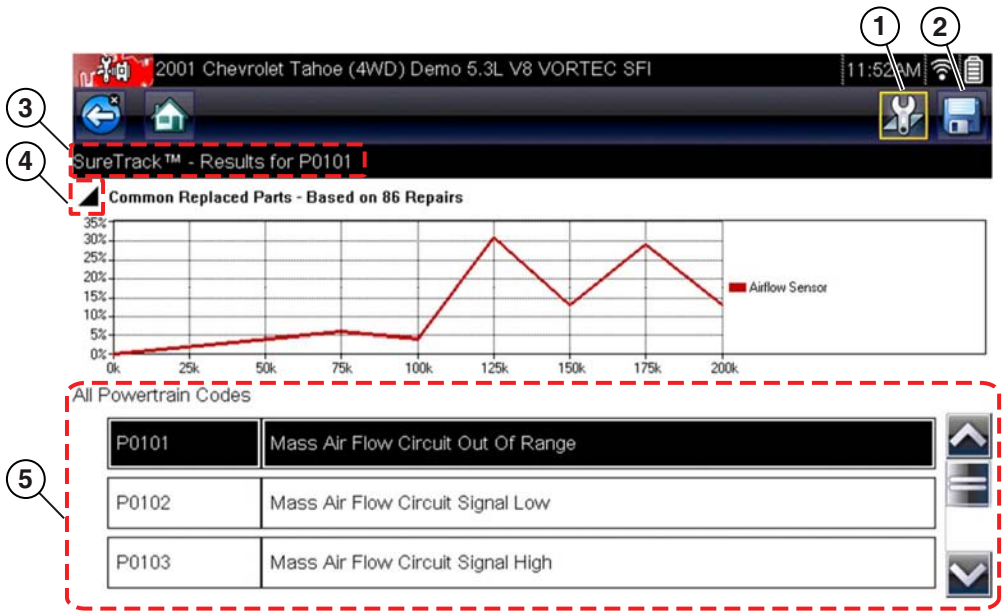


Figure 4-6 *DTC results*

1— Fix It! Icon — opens SureTrack Dashboard
2— Save Icon — saves the displayed DTCs to an (.XML) file
3— SureTrack Status Bar — displays active SureTrack status or result
4— Common Replaced Parts Graph Icon — toggles graph display on/off
5— DTC Results List — displays current DTCs

Submenu options may include:

- **Trouble Code Information**—opens a list of codes in ECM memory
- **History Codes**—opens a list of codes whose symptoms are not currently present. History codes indicate an intermittently occurring problem.
- **Failed This Ignition**—opens a list of codes that set during the current ignition cycle.
- **MIL SVS or Message Requested**—displays ECM requests to turn on the malfunction indicator lamp (MIL) or service vehicle soon (SVS) lamp, or display a driver information alert.
- **Last Test Failed**—displays a complete list of failed tests.
- **Test Failed Since Code Cleared**—displays a list of tests that failed since the last time codes were cleared from ECM memory.

Saving and Reviewing Codes

Selecting the **Save icon** (Figure 4-6) saves the displayed DTC results list as an (.XML) file. The (.XML) file can be reviewed later, by selecting **Previous Vehicles and Data > View Saved Data** and then selecting the (.XML) file from your saved file list (Figure 4-7). When opened, the (.XML) file displays basic vehicle information and a list of DTCs with a brief description of each.

Figure 4-7 *Typical - DTC (.XML) files in the **View Saved Data** list*

If SureTrack is active and data is available, additional troubleshooting information from SureTrack (e.g. Common Replaced Parts data (Figure 4-6), Real Fix and Related Fixes) will also be displayed. For additional information about accessing SureTrack and using it's features, see SureTrack, on page 38.

Saved (.XML) files can also be transfered to a personal computer (PC) using ShopStream Connect (Figure 4-8). Once the Diagnostic Tool is connected to the PC, (.XML) files can be printed, transferred, and copied. ShopStream Connect is a companion program that is available online, at no charge. See the ShopStream Connect website information at the front of this manual to visit the website and download the application.

NOTE:
(.XML) files transferred with ShopStream Connect are text files containing vehicle information, and the DTC list. The files can be viewed and printed from ShopStream Connect (Figure 4-8).

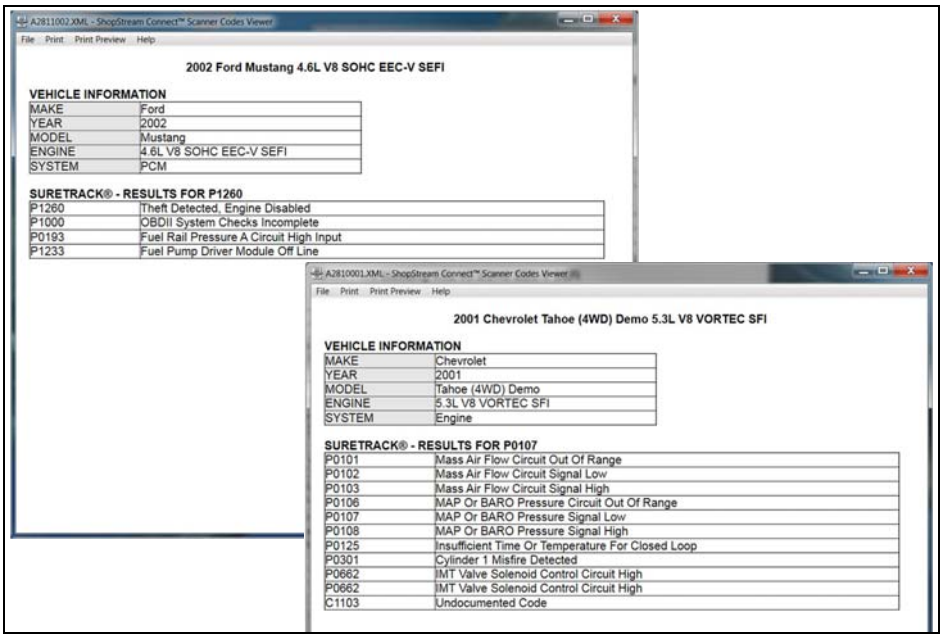


Figure 4-8 *Typical - (.XML) files, viewed in ShopStream Connect*

Clear Codes

The diagnostic tool clears codes from the vehicle electronic control module memory on most vehicles. If this function is not available on the test vehicle, Clear Codes does not appear as a menu option.

NOTE:
Clear Codes is also available from OBD-II Health Check (see OBD Health Check, on page 51).

To clear codes:

1. Select **Clear Codes** from the Codes Menu.
   A confirmation message displays.
2. Make sure any conditions shown on the confirmation message are met, then select **Yes**.
   A “codes cleared” message displays once the operation is complete.
3. Select **Continue** to return to the Codes Menu.

IMPORTANT:
Clearing codes erases all temporary ECM information, including Freeze Frame/Failure Records. Make sure no vital diagnostic information will be lost before clearing codes.

Freeze Frame/Failure Records

This selection displays the DTC that was set, along with corresponding data, when the ECM commanded the malfunction indicator lamp (MIL) to turn on.

DTC Status

This selection allows you to view the records of a particular DTC.

To check DTC status

1. Select **DTC Status** from the Codes Menu.
   The DTC Status entry field displays (Figure 4-9).
2. Use the touch keypad on the screen to enter the characters of the DTC.
3. Select the **Check Mark** icon on the toolbar once all the code characters are entered.
   The DTC status report displays (Figure 4-9).
4. Select **Back** to return to the DTC status entry screen.
5. Select **Back** again to return to the Codes menu.

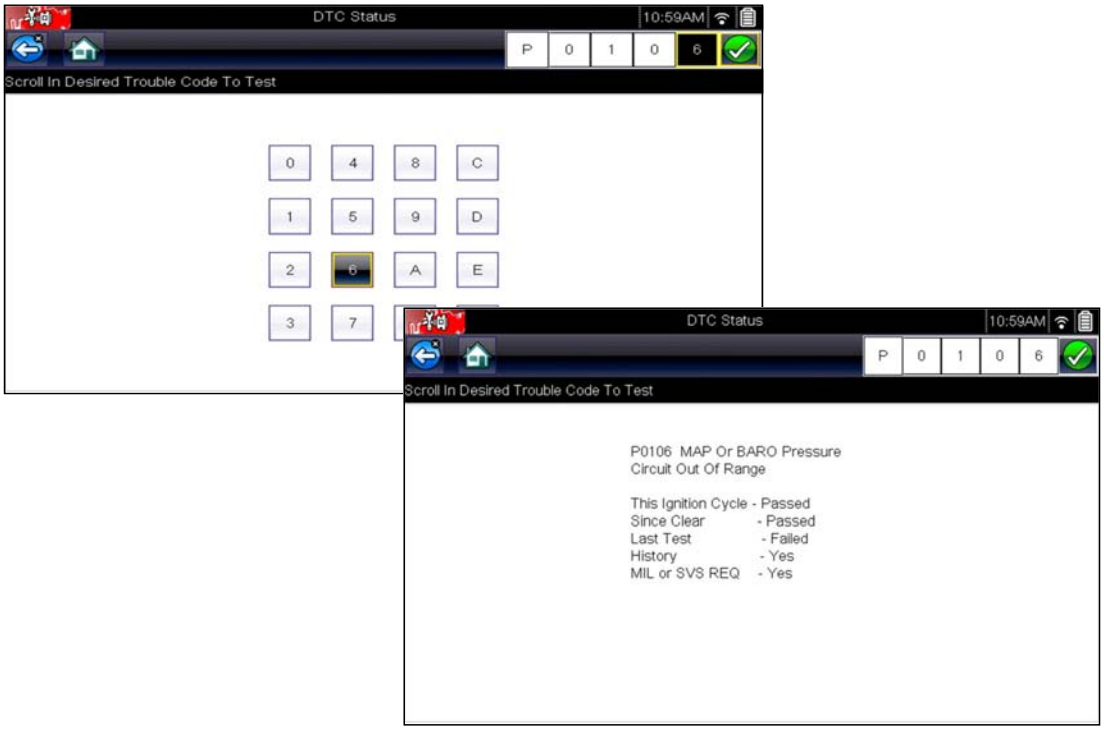


Figure 4-9 *DTC Status entry field*

Data Display

Select **Data** to view PID data from the vehicle ECM. In data display mode the screen has a toolbar and a main body (Figure 4-10).

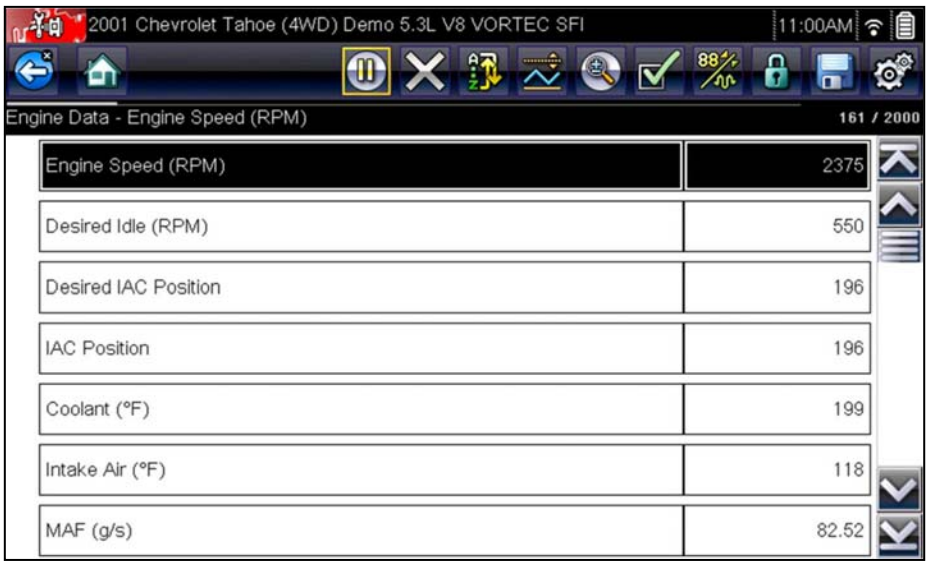


Figure 4-10 *Data display screen*

The toolbar control icons are described in Scanner Control Icons, on page 19 and Common Toolbar Control Icons, on page 14.

During data display the main body of the screen is divided into two columns; the left-hand column has a description of the parameter and the right-hand column shows the parameter value or state. Parameters are listed in the order in which they are transmitted by the ECM, so expect variations between years, makes, and models.

Up to three parameters can be locked, or fixed, at the top of the list. Locked parameters do not change as you scroll through the parameter list. The **Lock/Unlock** icon on the toolbar selects which parameters are fixed (see Locking Parameters, on page 30).

Displayed data may also be paused or saved for detailed review and future reference, see Saving Files, on page 33 and Pausing and Reviewing Data Files, on page 34.

Customizing the Data List

The **Custom Data List** icon on the toolbar is used to determine which specific parameters display. Minimizing the number of parameters on the data list allows you to focus on any suspicious or symptom-specific data parameters. You can add or remove most parameters from the list. Certain vital parameters may not be removed. These appear in gray at the top of the list along with a lock icon, and they cannot be selected.

NOTE:
Limiting the number of parameters that display to those that apply to a particular situation results in a faster data refresh rate, and reduces the amount of memory used for saved files.

To create a custom data list:

1. Select the **Custom Data List** icon on the toolbar to select it.

   The data selection screen displays and two new icons appear on the toolbar. Check marks to the left of the parameter description indicate which parameters are selected for display. A second smaller check box indicates a parameter that is locked.

   The toolbar icons provide options for selecting and deselecting parameters to include or remove from the custom data list:

Icon	Description
	Select/Deselect, use to mark individual parameters to hide or display. Any locked parameters cannot be deselected.
	Select All/Deselect All, use to hide or display all of the parameters in the list. Any locked parameters cannot be hidden.

2. Create a custom data list by selecting the parameters to include. A parameter that displays has a check mark alongside the name, a parameter that does not display does not. Select which parameters to display:
   a. Selecting the **Select All/Deselect All** icon immediately changes all of the parameters to the same condition, a second push changes them all back.
   b. Selecting the **Select/Deselect** icon activates it. Now you can add or remove parameters by selecting individual entries in the list.

   Note the following:
   - Items at the top of the list that cannot be highlighted are locked and cannot be turned off.
   - Use the **Select All** icon to display the complete list.
   - Use the **Deselect All** icon to remove all of the highlights.
3. Select **Back** to display the updated data list.

Changing Screen Views

Selecting the **View** icon opens a drop-down menu of options:

- PID List
- 1 Graph
- 2 Graph
- 4 Graph

The PID (parameter identification) List view is a 2-column display with the name of the parameters in the left column and their current values in the right column (Figure 4-10).

The 1, 2, and 4 Graph views divide the screen horizontally to simultaneously display data graphs for the indicated number of parameters (Figure 4-11). Use the scroll bar or the **up (▲)** and **down (▼)** icons to view other parameters in the list.

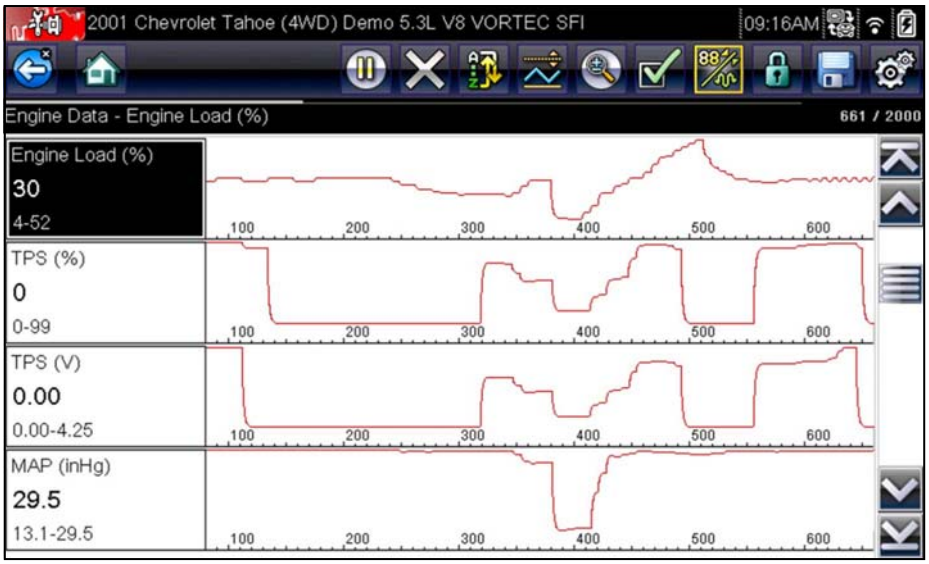


Figure 4-11 *Four graph view*

NOTE:
Any previously set conditions, such as held data or locked lines of data, remain in effect when the screen view is changed.

Locking Parameters

Use the **Lock/Unlock** icon to hold selected lines of the data in place and prevent them from scrolling, or to release previously locked lines of data. Up to three lines of data may be held at a time. This feature allows you to position related parameters together, making it easier to monitor their values and spot inconsistencies.

Locked parameters display as the top frames on the main body of the display screen, as well as at their usual position within the data list (Figure 4-12). A lock icon appears to the left of the parameter name to indicate it is locked.

To lock parameters:

1. Highlight the parameter to be locked.
2. Select the **Lock/Unlock** icon on the toolbar to lock it.

   A copy of the locked parameter is now shown at the top of the data list, and a lock icon appears alongside the parameter name.
3. Highlight and select additional parameters to lock.

   Up to three parameters can be locked at a time. Once locked, a parameter remains locked until it is manually unlocked or communication with the vehicle stopped.

Figure 4-12 *Locked parameters*

NOTE:
If three parameters are locked, one of them must first be unlocked before another parameter can be locked.

To unlock parameters:

1. Scroll through the data list and highlight the parameter to be unlocked, or released.
2. Select the **Lock/Unlock** icon on the toolbar.
   The released parameter and the lock icon disappear from the list at the top of the data list.
3. Repeat Step 1 and Step 2 to release other parameters if needed.

Setting Trigger Levels

The trigger icon allows you to configure the diagnostic tool to automatically save PID data from buffer memory to a file when a parameter value crosses a threshold. When triggering is armed, a "Trigger event" pauses data collection and saves data to a file.

Selecting the **Trigger** icon opens a menu that includes:

- **Set Trigger**—establishes upper and lower signal values to initiate an event capture for the highlighted parameter.
- **Arm Trigger**—activates the diagnostic tool to capture an event when the signal crosses a threshold value.
  Trigger lines change colors to indicate the trigger is armed.
- **Clear All Triggers**—deletes all previously set trigger levels.

If triggers are set the menu options are:

- **Clear Trigger**—deletes set trigger levels for the highlighted parameter.
- **Disarm Trigger**—de-activates event capture capability.
- **Clear All Triggers**—deletes all previously set trigger levels.

To set trigger levels:

1. Highlight the parameter to be used for triggering the recording.
2. Select the **Trigger** icon.
3. Select **Set Trigger** from the drop-down menu.

   A graph of the highlighted parameter with a trigger toolbar above it fills the main body of the screen (Figure 4-13).

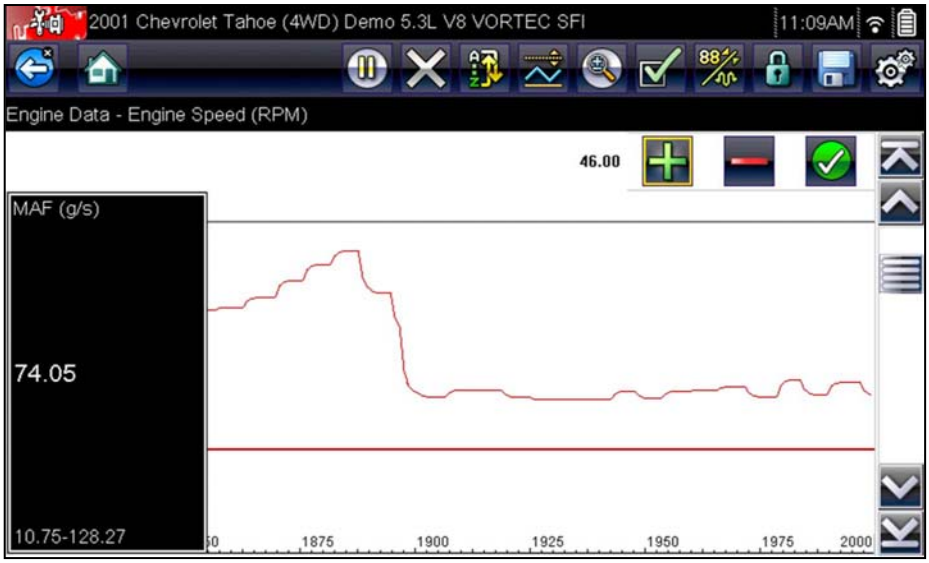


Figure 4-13 *Trigger set screen*

   The trigger level line displays as a solid line running horizontally across the data graph. An upper and lower trigger level must be set, the upper level is set first.

4. Select the plus (**+**) and minus (**–**) icons on the toolbar, or use the up ▲ and down ▼ arrow buttons to position the upper trigger level to where you want it on the graph.
5. Select ✓ on the toolbar, or press the **Y/**✓ button, to set the upper threshold.

   A lower trigger level line now appears at the mid-point of the graph.

6. Select the plus (**+**) and minus (**–**) icons on the toolbar, or use the up ▲ and down ▼ arrow buttons to position the lower trigger level line to where you want it on the graph.
7. Select ✓ on the toolbar, or press the **Y/**✓ button, to set the lower threshold.

The display returns to the PID data view and the trigger points appear as horizontal lines across the designated parameter graph. Repeat this procedure to establish trigger points for other parameters if desired. Once armed, any data points that register outside of your set conditions pause data collection and save data to a file.

NOTE:
Only three parameters can have trigger levels set at one time, but only one of the conditions needs to be satisfied for triggering to occur.

To arm triggers:

1. Select the **Trigger** icon on the toolbar.
2. Select **Arm Triggers** from the drop-down menu.

   The trigger lines on the data graphs change color to indicate an armed condition.

Triggers for all of the graphs are armed simultaneously. Once triggering is armed, it remains in that state until you switch it off. If trigger settings are modified or are added for other parameters, they are armed as soon as you exit the setting screen.

Saving and Reviewing Scanner / OBD-II/EOBD Data Files

The following procedures are used when saving and reviewing data files for Scanner and OBD-II/EOBD.

Saving Files

During normal operation, data from the vehicle's ECM is continuously being stored in buffer memory as it is displayed onscreen. Buffer memory is limited to a predetermined "total" size and is displayed on the counter (located below the toolbar on the right side of the screen) (Figure 4-15).

Selecting **Save** writes the stored buffer memory to a file. Saving data is useful when trying to isolate an intermittent problem or to verify a repair during a road test. The saved file can be played back (similar to a movie clip) by selecting **Previous Vehicles and Data > View Saved Data**. See View Saved Data, on page 61 for additional information.

NOTE:
The **Save icon** performs the same function as "Save Movie" function choice for the programmable **Shortcut** button, see Configure Shortcut Button, on page 64 for details.

The saved data file can also be downloaded to a personal computer (PC) using the Mini USB jack. Once connected to the PC, the data files can be printed, transferred, and copied using ShopStream Connect. ShopStream Connect is an application that creates an interface between the diagnostic tool and a PC. The ShopStream Connect application is available free online, see the ShopStream Connect website information at the front of this manual for additional information.

The toolbar control icons are described in Scanner Control Icons, on page 19 and Common Toolbar Control Icons, on page 14.

To save data:

- Select **Save**.

  A save dialog box displays while data is being saved. The data is saved when the message box disappears.

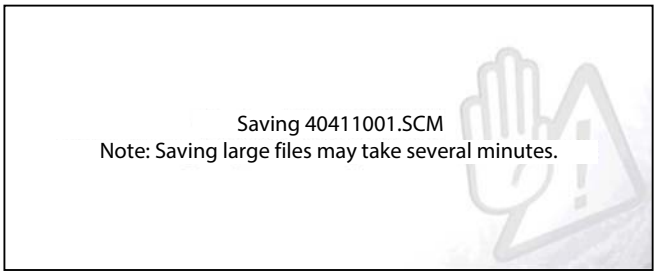


Figure 4-14 *Save dialog box*

Saving Screens

The **Shortcut** button can be programmed to save a snapshot of a visible screen as a bitmap file, see Configure Shortcut Button, on page 64 for details The saved file can be viewed by selecting **Previous Vehicles and Data > View Saved Data**., see View Saved Data, on page 61 for additional information.

Pausing and Reviewing Data Files

During normal operation, data from the vehicle's ECM is continuously being stored in buffer memory as it is displayed onscreen. The Pause feature, allows you to temporarily pause data collection to review it in detail.

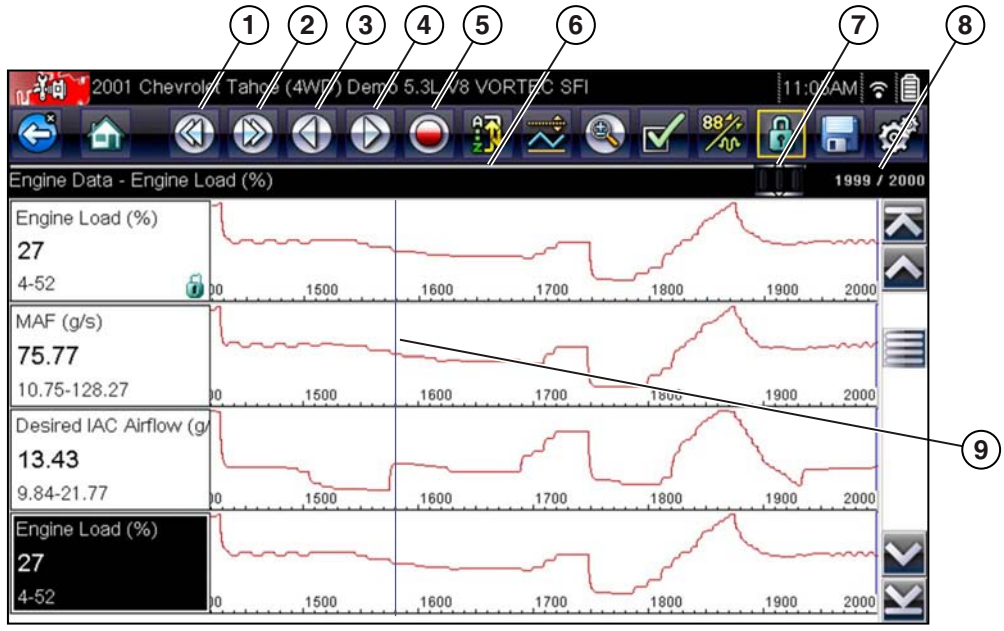
To pause and review data

Toolbar control icons are described in Scanner Control Icons, on page 19 and Common Toolbar Control Icons, on page 14.

1. While viewing data, select the **Pause** icon.

   On the toolbar, the playback control icons are displayed. A counter displays along the right-hand edge of the screen between the toolbar and the main body. A bar graph to the left of the counter shows how much data is in the memory buffer. A slider on the bar graph indicates the position of the current screen in relation to the entire contents of the data buffer.

   Use the slider to quickly scroll through the data. Use the control icons to accurately position the cursor. The cursor (vertical line), indicates your position when in the graph mode, appears once you begin navigating (Figure 4-15).



1— Skip Back
2— Skip Forward
3— Step Back
4— Step Forward
5— Record
6— Bar Graph
7— Slider
8— Counter (current position / total)
9— Cursor

Figure 4-15

2. Scroll up or down to review the list of data.
3. Select the desired control icon to move forward or back incrementally in the selected direction.

To resume:

- Select the **Record** icon.

  The display changes back to display data and the **Pause** icon is shown on the toolbar. A vertical rule runs through the data graph to indicate data was paused at that point.

NOTE:
The **Shortcut** icon can be set to perform the Pause/Play function. See Configure Shortcut Button, on page 64 for additional information.

Functional Tests

The **Functional Tests** selection is used to access vehicle-specific subsystem tests. Available tests vary by manufacturer, year, and model. Only the tests available for the identified vehicle display in the menu.

There are several types of functional tests:

- **Information Tests**—these are read-only tests, like selecting “VIN” from a Functional Tests menu to display the VIN of the identified vehicle.
- **Toggle Tests**—these tests switch a component, such as a solenoid, relay, or switch, between two operating states.
- **Variable Control Tests**—these tests command a certain value for a system or component, such as varying spark timing in 1° increments or EGR valve duty cycle in 10% increments.
- **Reset Tests**—these tests reset the adaptive, or learned, values that are stored in the vehicle electronic control module memory.
- **Scripted Tests**—these tests are software routines that place the vehicle into special operating modes for performing certain repairs, such as bleeding brakes with ABS.

Selecting Functional Tests opens a menu of test options that varies by make and model. Selecting a menu option either activates the test or opens a submenu of additional choices. Follow all screen instructions while performing tests. How and what information is presented on the screen varies according to the type of test being performed and the vehicle being serviced.

Toggle and variable control tests often display functional test controls on the toolbar at the top of the screen with PID data in the main body (Figure 4-16).

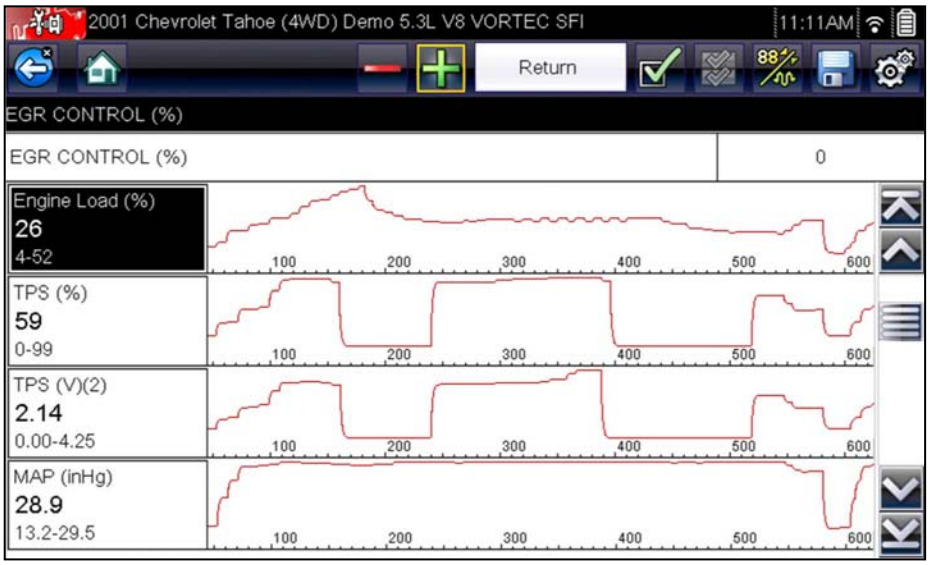


Figure 4-16 *Functional test screen*

A Test icon on the toolbar activates the test, and a Return, or similarly named, icon cancels the test. For variable control tests, the variable value displays between the main body and the toolbar. Plus and Minus icons on the toolbar increase and decrease the variable value.

A Data List icon, shown to the left, is available on the toolbar for some tests. This feature allows you to change which data list displays in the main body without exiting the functional test. The icon is only available when the test is inactive.

Generic Functions

Generic Functions are use to perform generic OBD-II/EOBD tests, for additional information see OBD Direct, on page 53.

Troubleshooter

Fast-Track® Troubleshooter is a database of experience-based repair strategies and information, that has been compiled and validated by top-notch technicians. Troubleshooter simplifies the diagnosis process, as it contains information on virtually all common diagnostic trouble code (DTC) problems and driveability symptoms.

Troubleshooter information is organized into a series of diagnostic tips that are designed to quickly lead you to the root cause of a particular problem. The tips are vehicle-specific, which means only tips that relate to the identified vehicle are presented. Selecting opens a menu that may include:

- **Code Tips**—provides detailed information on setting conditions, testing, and interpreting test results for specific codes.
- **Symptom Tips**—provides diagnostic tests and procedures based on vehicle operation.
- **Time Savers**—provides supplemental information, such as firing order and #1 cylinder location, that may be needed to make a diagnosis.
- **Common Problems**—provides advice and remedies for certain “pattern failures” that have been experienced on vehicles of the same model.
- **Tests and Procedures**—explains how to perform certain tests on the specific test vehicle. Some tips provide specifications and installation information as well.
- **Fast-Track Data Scan**—contains information and guidelines on how to validate data readings for certain sensors and actuators, PID data values are provided.
- **Fast-Track Fixes**—provides actual repair information for related repairs.

NOTE:
Troubleshooter appears in a Scanner menu only if tips are available for the system selected on the identified vehicle.

Certain PID data parameter values display directly within the tip when performing Troubleshooter tests and procedures. A tip may also contain a hyperlink to a Troubleshooter Reference, another test or procedure, or a supplemental operation, such as Clear Codes. Hyperlinks are shown in blue, and selecting them opens the link. Troubleshooter References open in a separate window. (Figure 4-17).

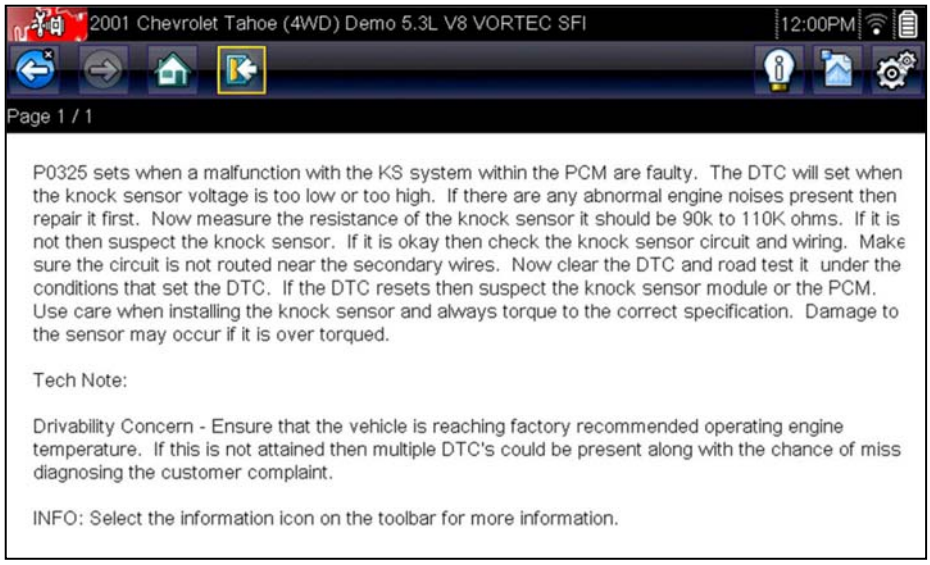


Figure 4-17 *Troubleshooter tip*

4.4 Exiting Scanner

Scanner function remains open as long as there is an active communication link with the vehicle. You must interrupt this communication link in order to exit from tests and power down the diagnostic tool. A warning message displays if you attempt to shut down while the diagnostic tool is communicating with the vehicle.

NOTE:
Damage to the vehicle electronic control module (ECM) may occur if communication is disrupted. Make sure the data cable is properly connected at all times during testing. Exit all tests before disconnecting the data cable or powering down the diagnostic tool.

To exit the Scanner function:

1. From any active data screen, select the **Back** icon on the toolbar.
   A “stopping communications” message briefly displays followed by the Data menu.
2. From the Data Menu, select **Back** on the toolbar.
   Again, a “stopping communications” message briefly displays followed by the Main menu.

Now, the diagnostic tool is no longer communicating with the vehicle and it is safe to return to the Home screen and power down the diagnostic tool.

4.5 SureTrack

SureTrack is a comprehensive source of expert knowledge for professional technicians, combining diagnostic experience and detailed parts replacement records. SureTrack will help you improve diagnostic accuracy and reduce repair time.

SureTrack features:

- A Common Replaced Parts graph displaying the parts that are most frequently replaced to successfully complete repairs based on actual vehicle repairs.
- Tips and fixes obtained from completed repairs, validated by SureTrack expert technicians.
- Up-to-the-minute intelligence based on vehicles currently being serviced nationwide.

NOTE:
To access SureTrack, you must have the current software update installed on your scan tool, the Wi-Fi radio turned on and connected to a wireless network. For Wi-Fi setup and connection see, Wi-Fi Setup and Testing, on page 43

4.5.1 SureTrack Operation

Before you begin using SureTrack, familiarize yourself with the SureTrack control icons shown below.

Fix It! Icon	Related Tips Icon	Real Fixes Icon	Menu Exit Icon	Common Replaced Parts Graph Icon
Opens the SureTrack dashboard	Displays Related Tips for the selected DTC	Displays Related Real Fixes for the selected DTC	Exits the SureTrack dashboard	Toggles Common Replaced Parts Graph display on/off

SureTrack repair information may be accessed while reviewing DTC using the Scanner function. As an example, navigate to **Engine > Codes Menu > Display Codes > Engine Trouble Code Information** to view current DTCs and related repair information.

If SureTrack information is available for a selected DTC, the SureTrack status bar will display "**SureTrack - Results for XXX**" (XXX = the selected DTC).

To view SureTrack information for a specific DTC, select the desired DTC from the list to highlight it, then select the **Fix It!** icon (Figure 4-18). Selecting **Fix It!** opens the SureTrack dashboard. See SureTrack Dashboard on page 40 for additional information.

NOTE:
The Common Replaced Parts graph can be viewed directly from the DTC results screen by selecting the Common Replaced Parts Graph icon, located to the left of Common Replaced Parts Graph title bar (Figure 4-18).

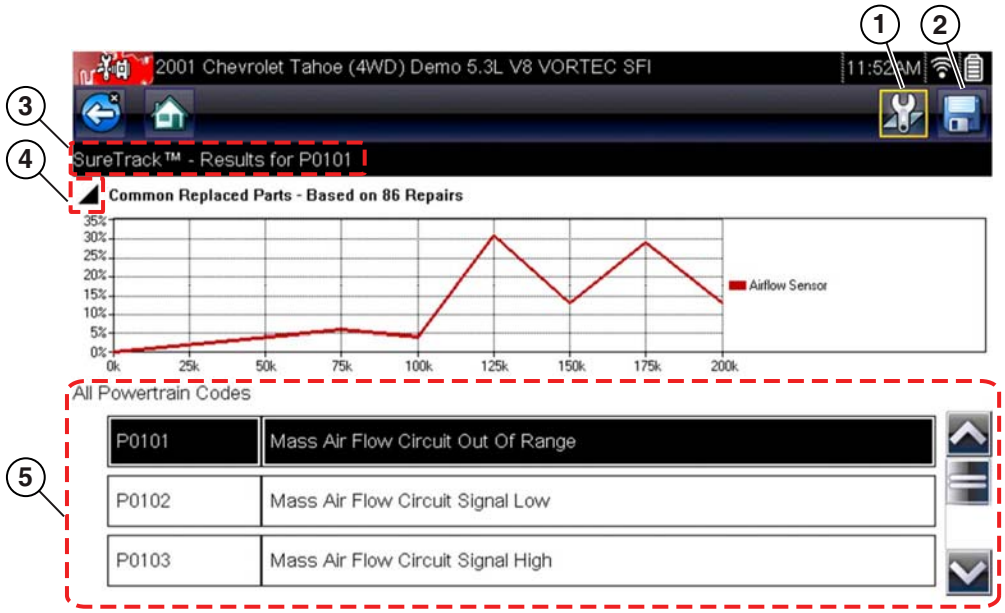


Figure 4-18 *SureTrack DTC results*

1— Fix It! Icon — opens SureTrack Dashboard
2— Save Icon — saves the DTCs list (see, **Saving and Reviewing Codes on page 25**)
3— SureTrack Status Bar — displays active SureTrack status or result
4— Common Replaced Parts Graph Icon — toggles graph display on/off
5— DTC Results List — displays current DTCs

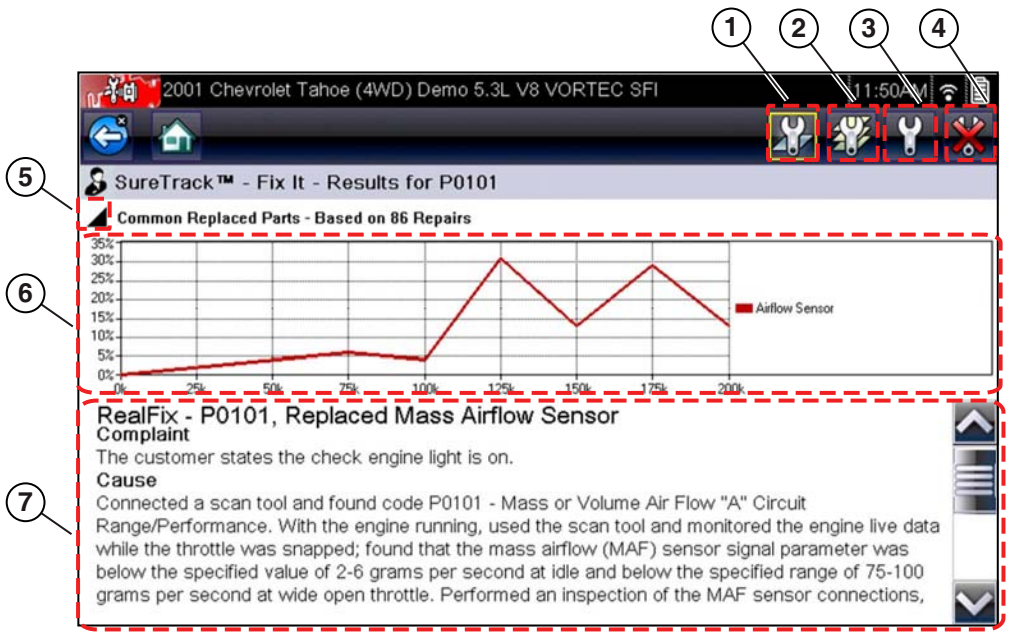
SureTrack Status Messages

Depending on your software version and connection status one of the following messages may appear in the SureTrack status bar:

- **SureTrack Content May Be Available! -** indicates SureTrack content may be available, however you are not currently connected to the SureTrack database. This message may be caused by a Wi-Fi connection issue or if you do not have the current scan tool software upgrade installed. See SureTrack Troubleshooting, on page 47 for SureTrack Troubleshooting information.
- **Loading content from SureTrack -** indicates SureTrack information is being updated from the SureTrack database.
- **A new diagnostic software upgrade is available. See your sales representative for details -** indicates your access to SureTrack will be expiring soon and you should contact your sales representative to purchase the current software upgrade.
- **Your SureTrack access has expired. See your Snap-on representative to renew. -** indicates your access to SureTrack has expired and you should contact your sales representative to purchase the current software upgrade.

SureTrack Dashboard

Selecting the **Fix It!** icon from the DTC results screen opens the SureTrack dashboard. The initial Dashboard screen displays both the Common Replaced Parts Graph and Real Fix information for the current DTC. Both the Related Tips and Related Fixes icons are also available from this screen (Figure 4-19).



1— Fix It! Icon
2— Related Tips Icon
3— Related Fixes Icon
4— Dashboard Exit Icon
5— Common Replaced Part Graph Icon — toggles graph display on/off
6— Common Replaced Part Graph
7— Real Fix Information

Figure 4-19 *SureTrack dashboard*

Common Replaced Parts Graph

The Common Replaced Parts graph is displayed by selecting the **Fix It!** icon or can be viewed directly from the DTC results screen by selecting the **Common Replaced Parts Graph** icon, located to the left of Common Replaced Parts Graph title bar. The Common Replaced Parts graph shows the percentage of verified fixes (using the parts listed) derived from the total number of repairs by mileage. The graph may display one or more replacement parts based on the captured information. The example below shows a common replaced part for DTC P0106. In this example, the Airflow Sensor is the most common replaced part based on 86 repairs involving vehicles with up to 200k miles. From the graph it can be determined that the majority of the repairs were made to vehicles with 125k or more miles, with 30% at 125k miles and approximately 28% at 175k miles (Figure 4-20).

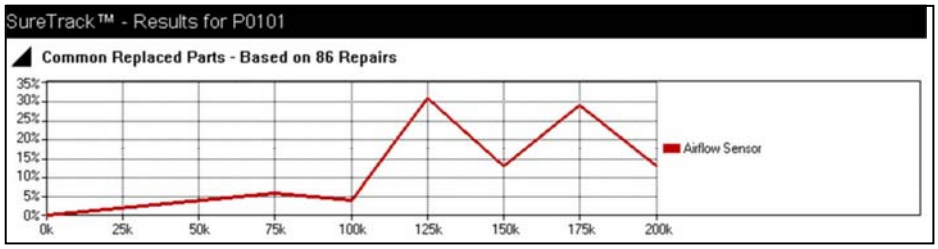


Figure 4-20 *Common Replaced Parts graph*

Real Fix

Selecting the **Fix It!** icon will display the most common Real Fix for the current DTC that has been obtained from actual shop repair orders and presented in a Complaint, Cause, Correction format (Figure 4-21).

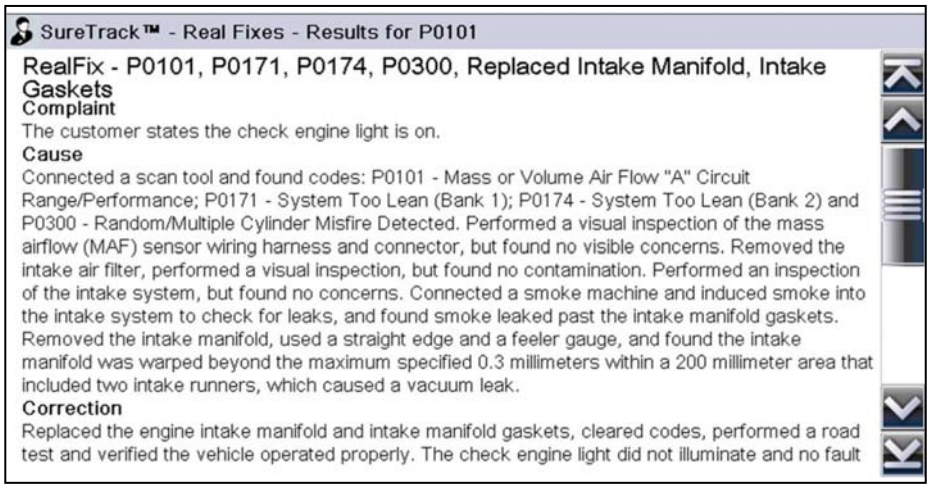


Figure 4-21 *Real Fix information*

Related Tips

Selecting the **Related Tips** icon will display a list of Related Tips. These are tips that may be related to the current DTC and have been obtained from actual shop repair orders. Selecting an item from the list, opens additional details about the Related Tip (Figure 4-22).

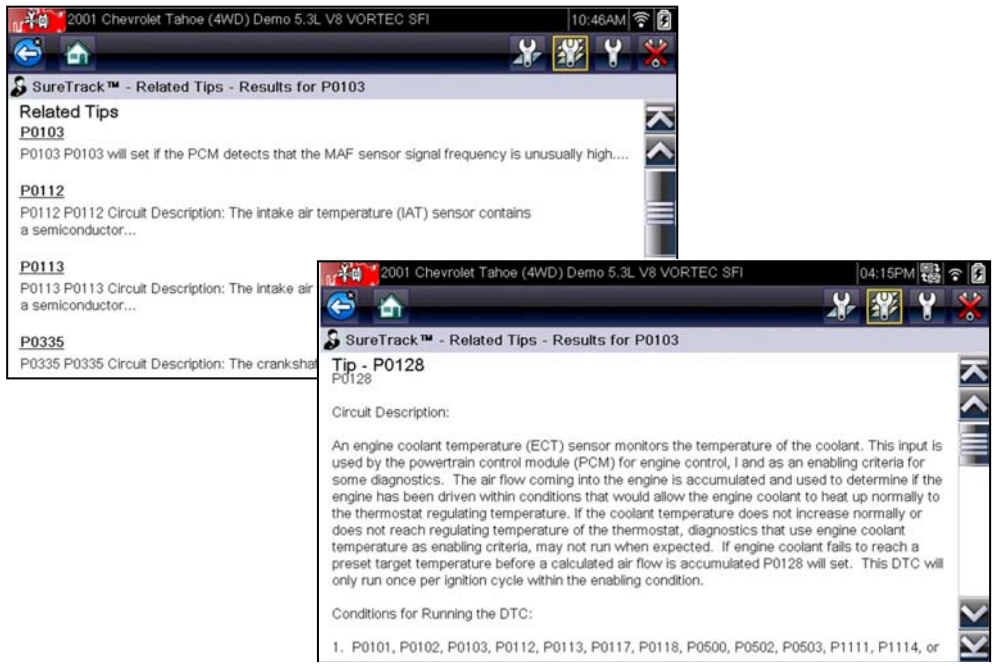


Figure 4-22 *Related Tips screens*

Related Real Fixes

Selecting the **Related Real Fixes** icon will display a list of Related Real Fixes. These fixes may be related to the current DTC and have been obtained from actual shop repair orders. Selecting an item from the list opens additional details about the Real Fix in a Complaint, Cause, Correction format (Figure 4-23).

Figure 4-23 *Related Real Fixes screens*

4.5.2 Wi-Fi Setup and Testing

Before you begin using SureTrack, you must turn the Wi-Fi radio on and select a wireless network connection. Familiarize yourself with the following configuration settings and the SureTrack control icons and indicators shown below.

The following control icons and indicators are used during configuration, testing and operation.

Wi-Fi Power Icon (toggle type)		Wi-Fi Test Icon	Wi-Fi Signal Strength Indicator	
Select to turn Wi-Fi ON	Select to turn Wi-Fi OFF	Select to open the Wi-Fi Test screen	Zero bars indicates Wi-Fi weak or no signal	Three bars indicates Wi-Fi full strength signal
Displayed on Wi-Fi configuration screen only			Displayed on the title bar next to the battery level indicator	

Wi-Fi Configuration

Turning Wi-Fi On

1. From the Home screen, navigate to **Tools > Settings > Configure Wi-Fi**.
   A screen message displays “Wi-Fi is Off”
2. Select the **Wi-Fi Power** icon to turn the Wi-Fi radio on (Figure 4-24).

Figure 4-24 *Wi-Fi Power icon*

1— Wi-Fi Power Icon (Wi-Fi Off shown)

The screen will change to display available supported network connections.

NOTE:
The Wi-Fi power icon will change from a green check mark icon to red “X” mark icon indicating Wi-Fi radio is currently set to on.

Connecting to a Wi-Fi Network

1. Select your desired network connection. Use the scroll feature to show all active connections (Figure 4-25).

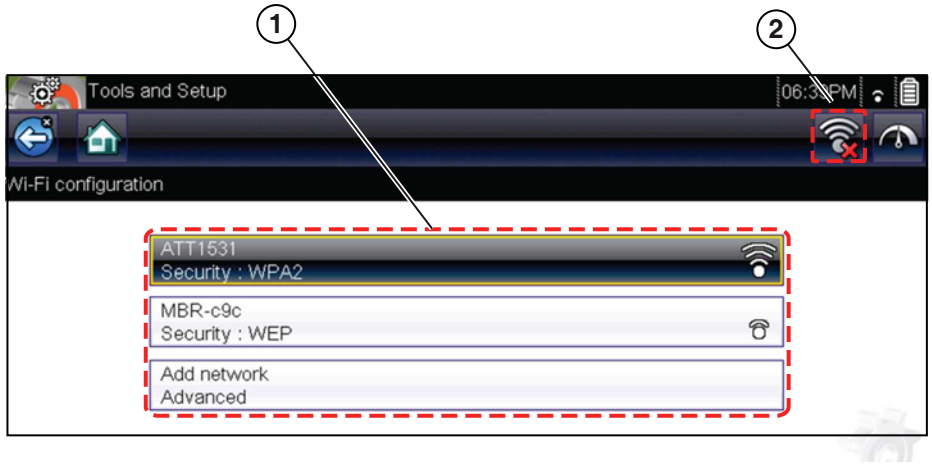


Figure 4-25 *Wi-Fi Configuration screen*

1— Available Network Connections

2— Wi-Fi Power Icon (Wi-Fi on shown)

NOTE:
A password is required when choosing a secured (protected) network. Enter the password using the on-screen keyboard and then select the green check mark on the keyboard to continue.

2. Select **Connect** to connect to your desired network or **Cancel** to cancel the request.
3. From the Connect confirmation screen select **OK** to continue using this connection or **Forget** to disconnect this connection.

   The screen will change to display your network connection highlighted with a connection status message “Connected” and a signal strength indicator showing the current Wi-Fi signal strength. If the status message “Not Connected” is displayed, retry the configuration process or see SureTrack Troubleshooting on page 47 for additional information.

4.5.3 Testing

If you are experiencing network connection issues, an automated testing feature is available to quickly test your network connection.

Testing Connections

1. Before you start the automated testing procedure, turn off the scan tool and then turn it on. This clears previous testing messages from memory.
2. Connect to your desired network, see Connecting to a Wi-Fi Network on page 44.

3. From the Wi-Fi configuration screen, select the **Wi-Fi Test** icon to open the network connection test screen (Figure 4-26).

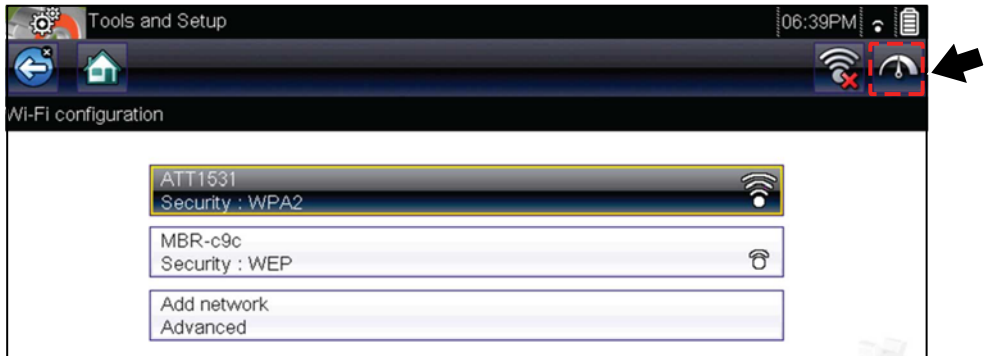


Figure 4-26 *Wi-Fi Test icon*

The network connection test is an automated test that begins when the screen is displayed. Network connection systems are tested in sequence and display a status indicator (Red = test failed or Green = test completed satisfactorily) when finished (Figure 4-27).

Connectivity of the following systems are checked:

- **Hardware**
- **Router**
- **Internet**
- **HTTP**
- **SureTrack**

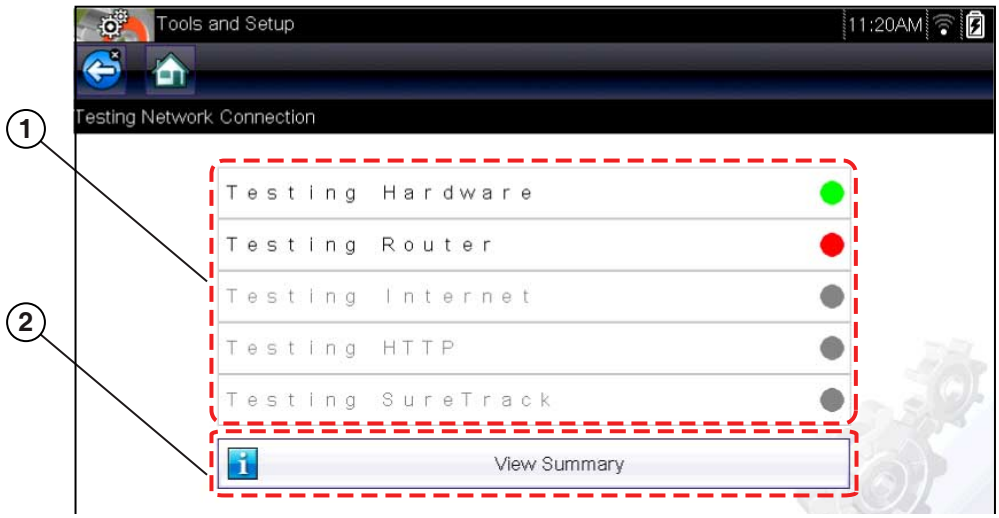


Figure 4-27 *Connection Tests*

1— Connection Tests

2— View Summary Icon

4. If a connection issue(s) is present, select **View Summary** to review the results. The summary information is helpful if you are experiencing difficulties with your connection (Figure 4-28). Scroll through the summary information to review the test results for each system and Tip messages for the current connection issue. See *Connection Tests - Troubleshooting* chart in SureTrack Troubleshooting on page 47 for additional information.

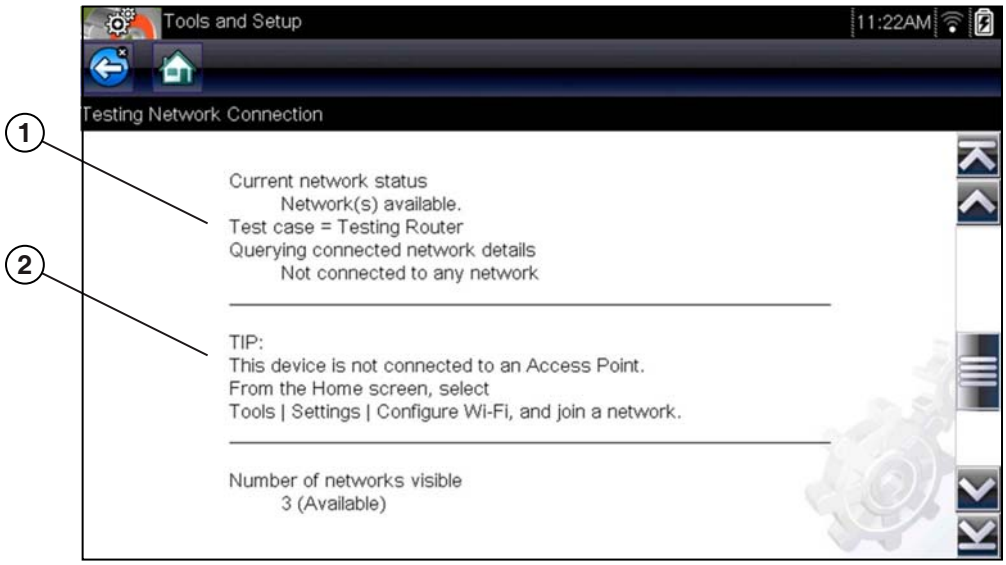


Figure 4-28 *View Summary*

1— Connection Test Results

2— Connection Issue Tip Message

4.5.4 SureTrack Troubleshooting

The following troubleshooting information is not inclusive and is meant as a guide only. Other issues and solutions may arise that are not stated here. The following description of terms are provided for reference as used in the following troubleshooting chart:

- **Router -** The data transmission device directly connected to your ISP.
- **Remote Wireless Access Point -** A wireless connection device between the router and your diagnostic tool.
- **Wi-Fi Radio -** The internal diagnostic tool radio transmitting and receiving Wi-Fi signals.
- **Network Connection -** Also called Wi-Fi connection. The configured Wi-Fi router connection the diagnostic tool connects to. This connection can be secured (password protected) or unsecured (open).

Router Information

Router compatibility and setup are important factors to check when trying to determine connectivity problems. Although we have tested this device at the factory to verify SureTrack connectivity, we cannot guaranty its connectivity with your specific equipment. There may be some situations that require your time for router connection troubleshooting and/or additional consultation and equipment. Snap-on Incorporated is not responsible for any costs incurred for any additional equipment, labor or consultation charges or any other costs that may result from correcting SureTrack non-connectivity issues with this device.

Check Router Settings

Verify the following router settings **BEFORE** you begin troubleshooting a non-connectivity or “No Connection” problem. After each check, make any corrections as necessary then retest for SureTrack connectivity. ***Contact your IT administrator or ISP for assistance.***

1. Check your router connection and if applicable, the remote wireless access point connection.
2. Clear saved WiFi networks, see Clearing Wifi Networks, on page 48.
3. Verify:
   (a). Router is configured to use Dynamic Host Configuration Protocol (DHCP), not a static IP address.
   (b). Router and/or settings for this device are configured to 2.4GHz. 5GHz is not supported.
   (c). Router is configured to B/G and/or N standard wireless networks to 2.4GHz. 5GHz is not supported.
   See your router "*User Guide"* for setup, connection and troubleshooting procedures.
4. Check for router firmware and update to current version, if applicable.
5. Restart or reset the router. See your router "*User Guide"* for procedures.
6. Connect to a different router.

Clearing Wifi Networks

1. Select the WiFi network that you are trying to connect to from the list of saved networks on the WiFi configuration menu.

The Wifi Summary page displays.

2. Select **FORGET**

The Wi-Fi Configuration menu displays.

3. Repeat steps (1) and (2) for ALL saved WiFi networks.
4. Once all saved WiFi networks have been deleted (forgotten) turn off the Diagnostic Tool.
5. Turn on the Diagnostic Tool and connect to the desired WiFi network, see Connecting to a Wi-Fi Network, on page 44.

General -Troubleshooting

Problem	Possible Cause	Corrective Action
SureTrack is not available	Access to SureTrack has expired	Update your diagnostic tool to the current software upgrade. Contact your sales representative for the latest software upgrade.
	Access to SureTrack may be temporarily unavailable	Try to access SureTrack at a later time as SureTrack may be performing updates to the service.
	Wi-Fi radio is turned Off	1. From the Home screen, navigate to **Tools > Settings > Configure Wi-Fi.** 2. Select the **Wi-Fi Power** icon and turn the Wi-Fi radio on. The Wi-Fi power icon will change from a green check mark icon to red "X" mark icon indicating Wi-Fi radio is on. 3. Connect to a known good network.
	Not connecting to a network	1. Clear saved WiFi networks, see Clearing Wifi Networks, on page 48. 2. Connect to a network. 3. From the Configure Wi-Fi screen select the **Wi-Fi Test** icon and review the results. See ***Connection Tests - Troubleshooting*** *in the following table*.
Wi-Fi connection drops off or disconnects intermittently	Wi-Fi Signal strength insufficient	Check Wi-Fi signal strength - out of range or interference. Move closer (within 50 Ft. (15 M) or into a direct open sight-line of the router or if applicable, remote wireless access point. Eliminate interference from overhead lights, windows, walls, other wireless devices, metal objects and devices that emit electrostatic discharge.
	Router overloaded	Disconnect/disable other Wi-Fi devices connected to the router.

Connection Tests - Troubleshooting		
Failed Test	**Possible Cause (Displayed Tip Message*)**	**Corrective Action / Checks**
Hardware	Wi-Fi radio not responding and/or will not turn off	Contact Customer Support for assistance.
	Wi-Fi radio not responding and/or will not initialize	
	Missing or corrupt firmware file(s)	
Router	This device is not connected to a router	Check Wi-Fi signal strength - out of range or interference. Move closer (within 50 Ft. (15 M) or into a direct open sight-line of the router or if applicable, remote wireless access point. Eliminate interference from overhead lights, windows, walls, other wireless devices, metal objects and devices that emit electrostatic discharge.
		Check router connection and setup. See Check Router Settings, on page 47 for procedure.
Internet	This device is not connected to the Internet or has no DNS	Check router connection and setup. See Check Router Settings, on page 47 for procedure.
		Domain Name System (DNS) server not connected. Contact your Internet service provider (ISP).
HTTP	This device cannot communicate using HTTP	Check if your Internet access requires either “Proxy” or “Accepting terms in a browser” protocol. These protocols are not supported by this device. Contact your IT administrator or ISP for options.
SureTrack	Your access to SureTrack has expired	Update your diagnostic tool to the current software upgrade. Contact your sales representative for the latest software upgrade.
	SureTrack service may be temporarily unavailable or Not connecting to a network	Try to access SureTrack at a later time as SureTrack may be performing updates to the service.
		Check router connection and setup. See Check Router Settings, on page 47 for procedure.
* See Testing, on page 44 for additional information.		

Chapter 5 OBD-II/EOBD

This chapter describes the basic operation of the OBD-II/EOBD function.

The **OBD-II/EOBD** icon is located on the Home screen.

The OBD-II/EOBD function allows you to access “generic” OBD-II/EOBD data. Generic OBD-II/EOBD data is data limited to emission related diagnostics such as:

- Checking for emissions-related diagnostic trouble codes (DTCs)
- Checking the cause of an illuminated malfunction indicator lamp (MIL)
- Checking monitor status prior to emissions certification testing

To access other available electronic control module (ECM) data for vehicle specific systems, parameters or enhanced diagnostics use the Scanner function, see Scanner on page 18.

NOTE:
The OBD-II/EOBD function can also be used to access “generic” OBD-II/EOBD data for OBD-II/EOBD compliant vehicles that are not included in the Scanner function databases.

5.1 Basic Operations

5.1.1 Screen Layout and Toolbar Controls

Screen layout and toolbar controls are similar to the Scanner function, see Screen Layout and Toolbar Icons, on page 18.

5.1.2 Connecting the Data Cable

Connection of the data cable to the diagnostic tool and vehicle DLC is required for OBD-II/EOBD testing, see Data Cable Connection, on page 17.

5.1.3 Saving and Reviewing Data Files

Save and Pause control icon operation and data review procedures are the same as used for the Scanner function, see Saving and Reviewing Scanner / OBD-II/EOBD Data Files, on page 33.

5.2 OBD-II/EOBD Menu

The following options are available from the OBD-II/EOBD menu:

- OBD Health Check
- OBD Direct

5.2.1 OBD Health Check

The OBD-II Health Check offers a way to quickly check for and clear emissions-related diagnostic trouble codes (DTCs), and to check readiness monitors for emissions testing. Selecting opens a connection message. Select **Continue** or press the **Y/✓** button to open a submenu of test options (Figure 5-1).

Figure 5-1 *OBD Health Check menu*

Global OBD II Code Check

Global OBDII Code Check displays stored emission related generic DTCs reported by the ECM. Selecting opens a submenu with two choices: Codes and Pending Codes. Either option opens a code list (Figure 5-2).

If SureTrack™ repair information is available for a selected DTC, the SureTrack results status message will display (Figure 5-2). Below the SureTrack results status message is the SureTrack Common Replaced Parts message and graph display icon ►. Select the graph display icon to toggle the Common Replaced Parts graph view on and off. For additional information about SureTrack, see SureTrack, on page 38.

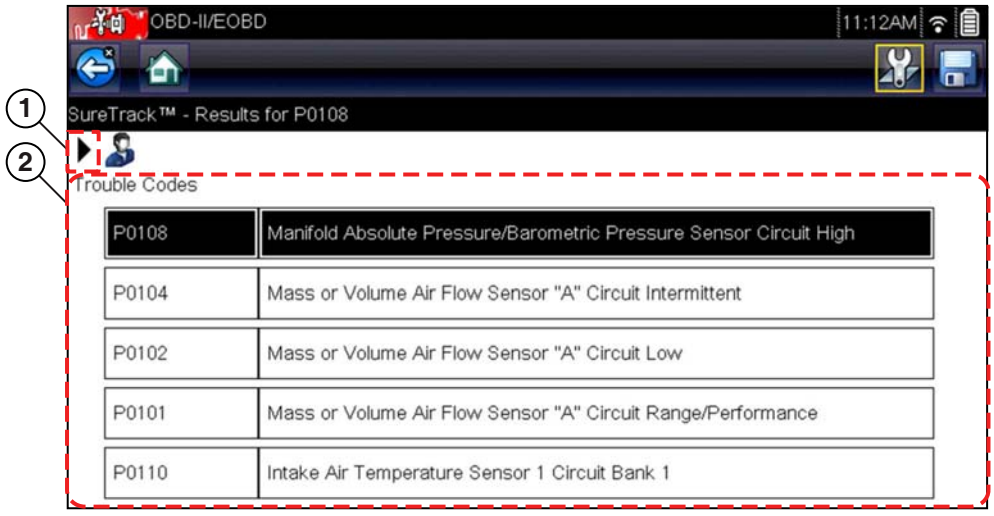


Figure 5-2 *Code list*

1— SureTrack Common Parts Graph Icon

2— DTC List

Codes

The Codes option displays a list of current emission related DTCs.

OBD-II/EOBD Codes have a priority according to their emission severity. The priority of the code determines the illumination of the MIL and the code erase procedure. Vehicle manufacturers have implemented the ranking differently, so there are differences between makes.

Pending Codes

The purpose of this service is to enable the diagnostic tool to obtain “pending” or maturing diagnostic trouble codes. These are codes whose setting conditions were met during the last drive cycle, but need to be met on two or more consecutive drive cycles before the DTC actually sets.

NOTE:
Save valuable time by using this service to verify test results after a single drive cycle following a vehicle repair and code clearing procedure.

- If a test failed during the drive cycle, the DTC associated with that test is reported. If the pending fault does not occur again within 40 to 80 warm-up cycles, the fault is automatically cleared from memory.
- Test results reported by this service do not necessarily indicate a faulty component or system. If test results indicate another failure after additional driving, then a DTC is set to indicate a faulty component or system, and the MIL is illuminated.

Refer to the *Global OBD Vehicle Communication Software Manual* for additional information.

Global OBD II Clear Codes

This option is used to clear all emission related diagnostic data, such as DTCs, freeze frame data, and test results, from the memory of the selected ECM. Although OBD-II/EOBD displays generic OBD-II/EOBD data only, clearing codes erases all of the stored data, including any enhanced codes and freeze frame information.

A confirmation screen displays when the clear codes option is selected to prevent accidental loss of data. Select to continue from the confirmation screen. Refer to the *Global OBD Vehicle Communication Software Manual* for additional information.

Readiness Monitors

This test checks the status of the readiness monitoring system. An OBD-II /EOBD control system runs continuous and periodic tests to check the status of emission-related subsystems to gauge the integrity of the electronic operations. Two options are available for Readiness Monitors:

- **Monitors Complete Since DTC Cleared**—displays the status of all monitors that have run since the last time ECM memory was erased.
- **Monitors Complete This Cycle**—displays the status of the monitors that ran during the current drive cycle only.

Select either option and test results are shown in the data viewer (Figure 5-3).

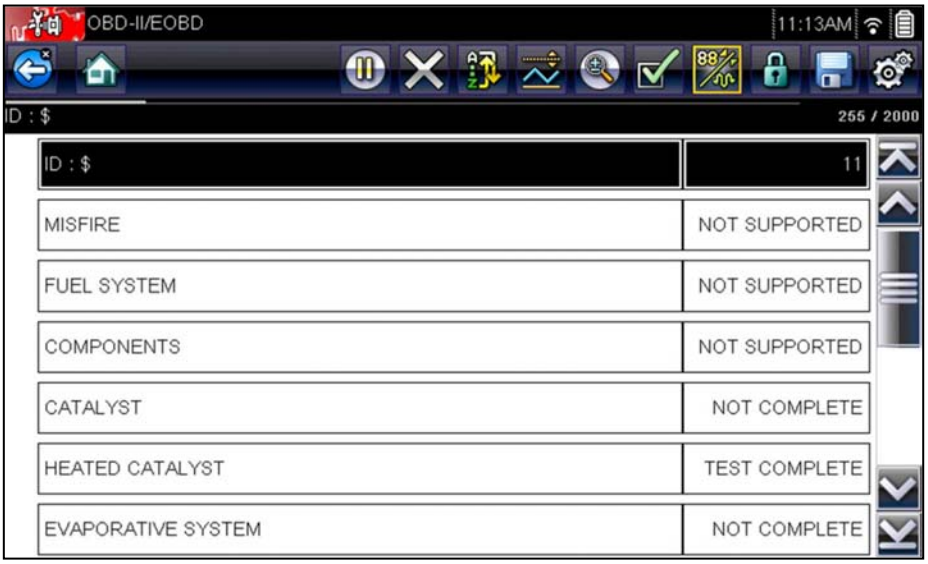


Figure 5-3 *Readiness monitor test report*

Scroll to view the entire list of Readiness Monitors to ensure that all tests are complete. Select **Save** from the toolbar and follow the screen prompts to save a copy of the monitor report as part of the vehicle records.

MIL Status

This test checks the ECM commanded state (on or off) if the malfunction indicator lamp.

5.2.2 OBD Direct

OBD Direct includes the following menu and submenu choices:

- **OBD Diagnose**
  - **Start Communication** - initiates a test session
  - **Connector Information** - provides DLC location details
  - **Manual Protocol Selection** - provides choices for communication protocol
- **OBD Training Mode** - allows you to familiarize yourself with the capabilities of OBD-II/EOBD while navigating through menus without being connected to a vehicle.

Start Communication

Use the following procedure to begin an OBD-II/EOBD test session:

To perform an OBD-II/EOBD Test:

1. Connect the data cable to the test vehicle.
2. Select **Start Communications** from the OBD-II/EOBD menu.

   A series of messages are displayed indicating automatic detection of vehicle type (12 or 24 V) has occurred and then the detected controllers are displayed.

   The diagnostic tool establishes a communication link with the test vehicle, then opens an information screen (Figure 5-4).

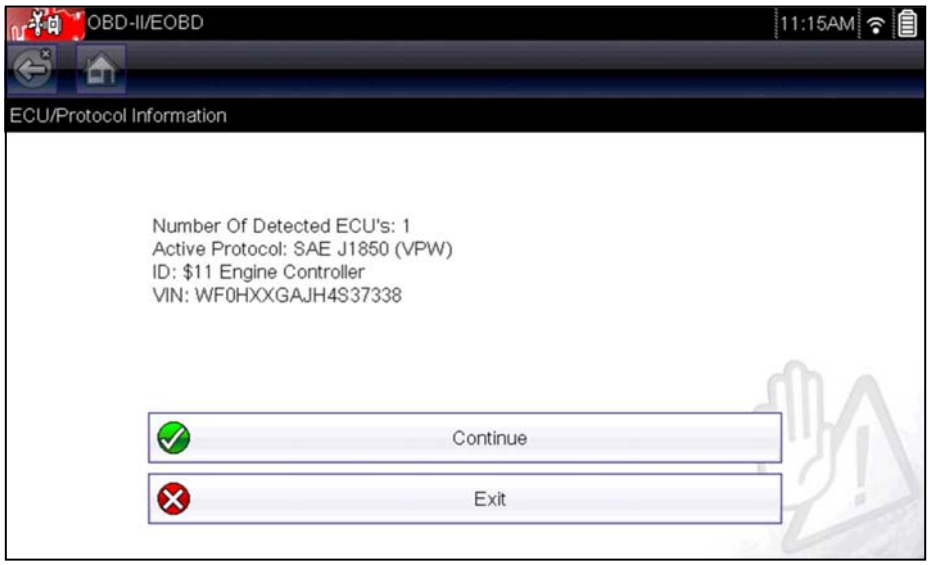


Figure 5-4 *Protocol information*

   The information screen shows how many control modules were detected, which ECM is communicating, and which communication protocol is being used.

3. Select **Continue**.

   A Select Service menu of available tests opens:

   - Readiness Monitors, on page 55
   - MIL Status, on page 55
   - Fast-Track Troubleshooter, on page 55
   - ($01) Display Current Data, on page 56
   - ($02) Display Freeze Frame Data, on page 56
   - ($03) Display Trouble Codes, on page 56
   - ($04) Clear Emissions Related Data, on page 56
   - ($05, 06, 07) Display Test param./Results, on page 57
   - ($08) Request Control of On-board System, on page 58
   - ($09) Read Vehicle Identification, on page 58
   - ($09) In-use Performance Tracking, on page 58
   - ($0A) Emission Related DTC with Permanent Status, on page 58

IMPORTANT:
All service modes are not supported by all vehicles, so the available menu selections will vary.

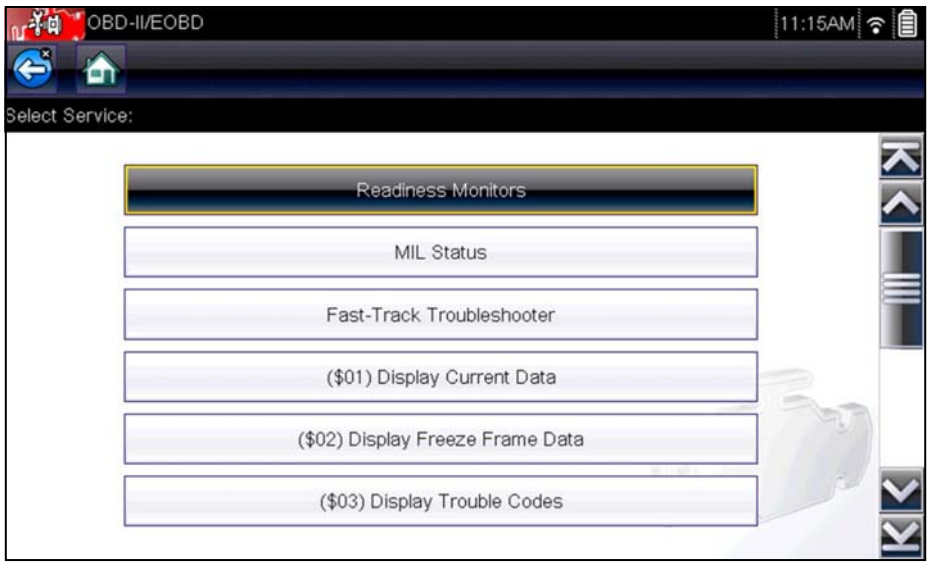


Figure 5-5 *Service mode menu*

4. Select a test to continue.

Readiness Monitors

Use this menu item to check the readiness of the monitoring system. Monitors not supported will display “not supported”. Scroll, if needed, to view the entire list of monitors (Figure 5-3). Selecting Readiness Monitors opens a submenu with two choices:

- **Monitors Complete Since DTC Cleared**—displays the results of all monitor tests that have run since the last time the vehicle electronic control module (ECM) memory was cleared.
- **Monitors Complete This Cycle**—displays only the results of monitor tests that ran during the current drive cycle, they reset when the ignition is switched off.

MIL Status

This item is used to check the current condition of the malfunction indicator lamp (MIL). Additional information, such as which ECM commanded the MIL on and the distance driven while the MIL is on (if supported), can also be displayed. The MIL Status report can also be saved as part of the vehicle records.

Fast-Track Troubleshooter

Fast-Track® Troubleshooter is a database of experience-based repair strategies and information, that has been compiled and validated by top-notch technicians. The Troubleshooter system simplifies the diagnosis process, as it contains information on virtually all common diagnostic trouble code (DTC) problems and driveability symptoms for most vehicles covered by the vehicle communication software.

($01) Display Current Data

Use this test to display the serial data transmitted by the selected vehicle electronic control module (ECM). The main body of the screen has two columns; the left-hand column is a description of the parameter and the right-hand column is the parameter value or state. Viewing options and operations are the same as the Scanner function, see Data Display, on page 28 for more information.

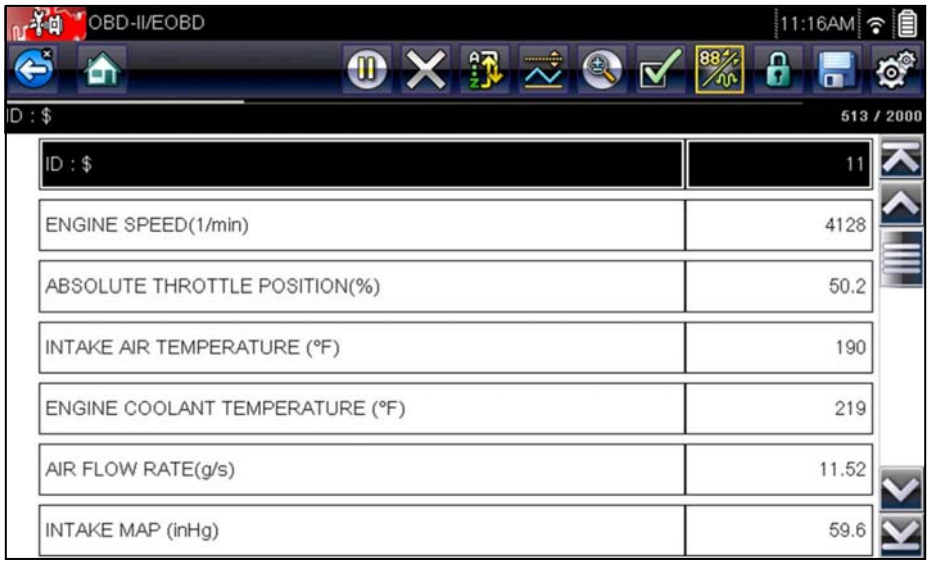


Figure 5-6 *Current data display*

($02) Display Freeze Frame Data

Freeze frame data provides a “snapshot” of critical parameter values at the time a DTC set.

This item is used to display freeze fame data for any stored emission related diagnostic trouble codes (DTCs). In most cases the stored frame is the last DTC that occurred. Certain DTCs, those that have a greater impact on vehicle emissions, have a higher priority. In these cases, the highest priority DTC is the one for which the freeze frame records are retained.

($03) Display Trouble Codes

This is used to display any stored emission related DTCs reported by the ECM. The display is similar to the Scanner function code display (see Data Display, on page 28 for details). The list does not include enhanced DTCs in this mode.

($04) Clear Emissions Related Data

This item is used to clear all emission related diagnostic data, such as DTCs, freeze frame data, and test results, from the memory of the selected ECM.

To clear emission related Data:

1. Select **Clear Emissions Related Data** from the menu.
   A confirmation message displays to help prevent loss of any vital data (Figure 5-7).

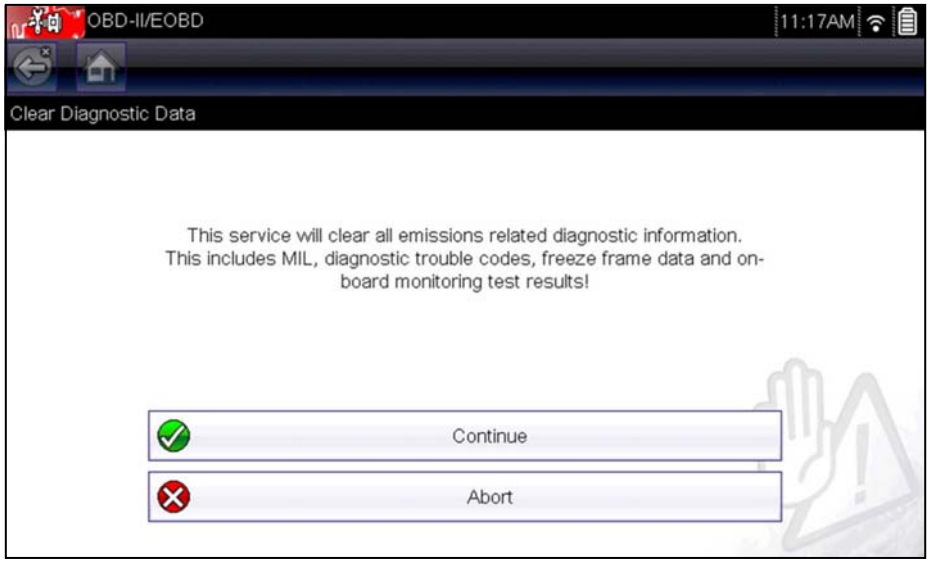


Figure 5-7 *Clear codes confirmation message*

2. Continue from the confirmation message.
   The screen updates several times as ECM memory is erased, then a “data has been cleared” message displays.
3. Select **Continue** to return to the Select Service menu.

($05, 06, 07) Display Test param./Results

This option opens a submenu of parameters and test results from various sensors, monitor test results, and a record of DTC setting conditions detected during the last drive cycle. The submenu includes:

- ($05) Oxygen Sensor Monitoring
- ($06) On-board Monitored Systems
- ($07) DTCs Detected During Last Drive

($05) Oxygen Sensor Monitoring

This option opens a menu of tests available for checking the integrity of the oxygen (O2) sensors. Making a selection displays all of the pertinent O2 sensor parameters for the specific test. The test identification (ID) displays at the top of the data list.

($06) On-board Monitored Systems

This option opens a menu of tests from the monitored systems. The available data is for specific systems and components that the on-board diagnostic system monitors continuously, such as misfire, or non-continuously, such as the catalyst system. Making a menu selection displays the test results.

($07) DTCs Detected During Last Drive

This test opens a record of any DTCs that set during the last completed drive cycle. Select to open the DTC list.

($08) Request Control of On-board System

This service enables bidirectional control of the ECM. This service allows the diagnostic tool to control the operation of an on-board system, test, or component.

($09) Read Vehicle Identification

The purpose of this service is to enable the diagnostic tool to request and display vehicle-specific information, such as the vehicle identification number (VIN), the calibration identification, and the calibration verification number (CVN), of the test vehicle. Select a menu item to retrieve the information. Select **Return** to go back to the menu.

($09) In-use Performance Tracking

This option displays the “In-use Performance Tracking” of data. It is a record of the number of times each of the monitor tests have been completed. Select **Return** to go back to the menu.

($0A) Emission Related DTC with Permanent Status

This option displays a record of any “permanent” codes. A permanent status DTC is one that was severe enough to illuminate the MIL at some point, but the MIL may not be on at the present time.

Whether the MIL was switched off by clearing codes or because the setting conditions did not repeat after a specified number of drive cycles, a record of the DTC is retained by the ECM. Permanent status codes automatically clear after repairs have been made and the related system monitor runs successfully.

Connector Information

This option opens a database of vehicle diagnostic connector locations that includes most makes and models. The menu driven interface leads you quickly to difficult to find test connectors.

To locate a vehicle diagnostic connector:

1. Select **Connector Information** from the System menu.
   A list of vehicle manufacturers displays.
2. Select a manufacturer from the list.
   A list of models available from the selected manufacturer displays.
3. Select a model from the list.
   If a cable adapter is needed, which one and how to connect it displays.
4. Select **Continue**.
   Information on where to locate the vehicle diagnostic connector displays.
5. Select **Continue** to return to the System menu.

Manual Protocol Selection

Communication protocol is a standardized way of transferring data between an ECM and a diagnostic tool. Global OBD may use the following communication protocols:

- ISO 15765-4 (CAN)
- ISO 27145 (WWHOBD CAN)
- ISO J1939 (CAN)
- ISO 9141-2 (K-LINE)
- SAE J1850 PWM (Pulse Width Modulation)
- SAE J1850 VPW (Variable Pulse Width)
- ISO 14230-4 (Keyword Protocol 2000)
- SAE J2284/ISO 15765-4 (CAN)

When initially attempting to establish communication with the ECM the diagnostic tool attempts to communicate trying each protocol in order to determine which one is being used. During normal operation the communication protocol is automatically detected. If automatic detection fails, communication protocol can be manually selected.

IMPORTANT:
Using unsupported OBD communication protocols may activate warning lights and can set network related faults. Only use the manual selection option when OBD protocol is already known.

Select **Manual Protocol Selection** to open a menu of options (Figure 5-8).

Figure 5-8 *Manual protocol selection menu*

Select the **Back** icon or press the **N/X** button to return to the OBD-II/EOBD Main menu.

Chapter 6 Previous Vehicles and Data

This chapter describes the basic operation of the Previous Vehicles and Data function.

The **Previous Vehicles and Data** icon is located on the Home screen. This function allows you to select recently tested vehicles and access saved data files.

6.1 Previous Vehicles and Data Menu

The following options are available from the Previous Vehicles and Data menu:

- Vehicle History
- View Saved Data, on page 61
- Delete Saved Data, on page 62

6.1.1 Vehicle History

The diagnostic tool stores the identification of the last twenty-five vehicles tested, so there is no need to go through the complete vehicle identification sequence when performing a retest after repairs have been made. The oldest vehicle record is deleted when a new vehicle is identified once there are twenty-five vehicles on file.

Figure 6-1 *Vehicle history list*

To select from the vehicle History:

1. Select **Previous Vehicles and Data** from the Home screen.
2. Select **Vehicle History** from the menu.

   A list of up to 25 previously tested vehicles displays. Each vehicle is given a unique file name. Scroll to view the entire list.
3. With the item to be opened highlighted, either select the vehicle ID or press the **Y/✓** button.

   The appropriate software loads and a vehicle ID confirmation screen displays.
4. Select **OK** or press the **Y/✓** button to continue.

   The System Menu for the selected vehicle displays.

6.1.2 View Saved Data

Selecting the **View Saved Data** menu option opens a list of all the saved data (movie) files and screen images that are stored in memory. Saved files are listed in chronological order by the date and time that they were created with the most recent files are at the top of the list.

Figure 6-2 *Saved data list*

Saved files can either be opened directly on the diagnostic tool, or downloaded to a personal computer and opened using ShopStream Connect. See Pausing and Reviewing Data Files, on page 34 and Connect-to-PC, on page 64 for additional information.

NOTE:
A maximum of 50 files are displayed. To view all (if more than 50) files stored, use ShopStream Connect. See Connect-to-PC, on page 64 for additional information.

To review a saved data file or image:

1. Select **Previous Vehicles and Data** from the Home screen.
2. Select **View Saved Data** from the menu.
3. Select a file to review from the list.

6.1.3 Delete Saved Data

This menu option is used to permanently erase saved files from memory.

To delete a saved file:

1. Select **Previous Vehicles and Data** from the Home screen.
2. Select **Delete Saved Data** from the menu.

   A list of saved files displays.

NOTE:
The Select All/Deselect All and Delete icons become available on the toolbar so that you can either delete individual files or clear the entire memory buffer all at once.

3. Select a file from the list and a confirmation message displays.
4. Select an option from the confirmation message:
   - **OK**—deletes the selected file and returns to the saved files list, which no longer includes the deleted file.
   - **Cancel**—returns to the saved files list without deleting the selected file.
5. Select **Back** on the toolbar to return to the Previous Vehicles and Data menu, select **Home** to return to the Home screen.

Chapter 7 Tools

This chapter describes the basic operation of the Tools function.

The **Tools** icon is located on the Home screen. This function allows you to configure diagnostic tool settings to your preferences.

7.1 Tools Menu

The following options are available from the Tools menu:

- Connect-to-PC—use to transfer and share files with a personal computer (PC)
- Configure Shortcut Button, on page 64—use to change the function of the shortcut button
- System Information, on page 65—use to view configuration information for the diagnostic tool
- Settings, on page 65—use to configure certain characteristics of the diagnostic tool

Figure 7-1 *Tools menu*

7.1.1 Connect-to-PC

Connect-to-PC allows you to transfer saved data files on your diagnostic tool to your personal computer using a USB cable.

The optional ShopStream Connect™ PC software allows you to view, print and save data files on your PC. In addition, you can download software updates from the PC to the diagnostic tool. These features provide an ideal way to manage saved data files. The ShopStream Connect application is available free online, see the ShopStream Connect website information at the front of this manual for additional information.

To connect the diagnostic tool to a PC:

1. Select **Tools** from the Home screen to open the menu.
2. Select **Connect-to-PC** from the Tools and Setup menu.

   A screen message displays stating that the diagnostic tool can be connected to a PC as a mass storage device.
3. Connect the supplied USB cable to the diagnostic tool and then to the PC.
4. Select **Continue**.
5. Follow the instructions on the screen to complete the operation.

A USB cable, supplied with your diagnostic tool, is used to connect the diagnostic tool to the PC. When the diagnostic tool is connected to the PC a communications icon appears on the right edge of the title bar.

7.1.2 Configure Shortcut Button

This feature allows you to change the function of the **Shortcut** button. Options are:

- **Brightness**—opens the brightness setting screen.
- **Save Screen**—saves a bitmap image of the visible screen.
- **Save Movie**—writes PID data from buffer memory to a file for future playback.
- **Show Shortcut Menu**—opens the menu so you can quickly select from any of the functions.
- **Toggle Record/Pause**—programs the Shortcut button to work as the Pause and Play icons.

To assign a function to the Shortcut button:

1. Select **Tools** from the Home screen.

   The Tools menu opens.
2. Select **Configure Shortcut button** from the menu.
3. Select a function from the menu.
4. Select the **Back** on the toolbar or press the **N/X** button to return to the options menu.

7.1.3 System Information

System Information allows you view patent information and system information such as the software version and serial number of your diagnostic tool.

Figure 7-2 *System information*

To display the System information screen:

1. Select **Tools** from the Home screen to open the menu.
2. Select **System Information** from the menu.
   The System Information screen displays.
3. Scroll as needed to view all of the data.
4. Select **Back** on the toolbar or press the **N/X** button to return to the options menu.

7.1.4 Settings

This Tools selection allows you to adjust certain basic diagnostic tool functions to your personal preferences. Selecting opens an additional menu that offers the following:

- System Settings - see System Settings, on page 65
- Configure Wi-Fi - see Wi-Fi Configuration, on page 43
- Configure Scanner - see Configuring Scanner, on page 71
- Configure Units - see Configure Units, on page 72

System Settings

Selecting System Settings opens a menu with two options; Display and Date & Time. Either selection opens an additional menu.

Display options include:

- Brightness, on page 66—adjusts the intensity of the screen back lighting.
- Color Theme, on page 67—changes the background color of the screen display.
- High Contrast Toolbar, on page 67—enhances toolbar graphics for poor lighting conditions.
- Font Type, on page 68—switches between standard and bold text for better visibility.
- Backlight Time, on page 68—adjusts how long the screen stays on with an idle diagnostic tool.
- Touch Screen Calibration, on page 69—calibrates the touch screen display.

Date & Time options include:

- Time Zone, on page 69—sets the internal clock to the local time standard.
- Clock Settings, on page 70—sets the time on the internal clock.
- Daylight Savings Time, on page 70—configures the clock for Daylight Savings Time.
- Time Format, on page 71—switches the time displays between a 12 or 24 hour clock.
- Date Format, on page 71—configures how the month, date, and year displays.

Brightness

Selecting this option opens the brightness setting screen for adjusting the back lighting of the display (Figure 7-3).

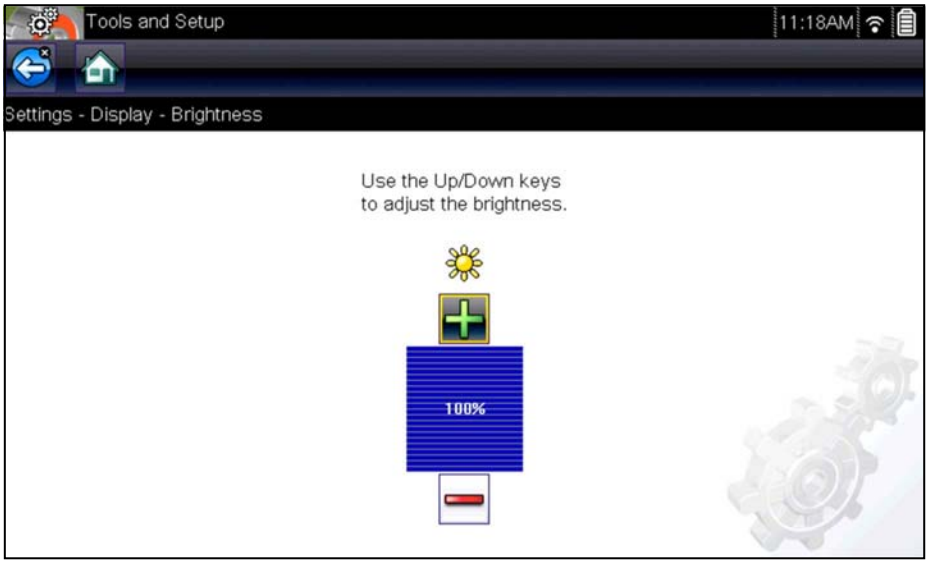


Figure 7-3 *Brightness setting*

Each push of the **Plus** and **Minus** icons, or the up (▲) and down (▼) arrows, incrementally changes the back lighting up or down respectively.

Select **Back** from the toolbar or press the **N/X** button to exit.

Color Theme

This option allows you to select between a white and black background for the screen. The black background can be beneficial when working under poor lighting conditions.

Selecting opens a menu with two choices: **Day Theme** (white background) and **Night Theme** (black background). Make a selection and a “please wait” message momentarily displays followed by the Home screen. The new toolbar setting is now active.

High Contrast Toolbar

This option allows you to switch to a high contrast toolbar. This toolbar features black and white icons with crisp graphics that are easier to see in poor lighting conditions or bright sunlight.

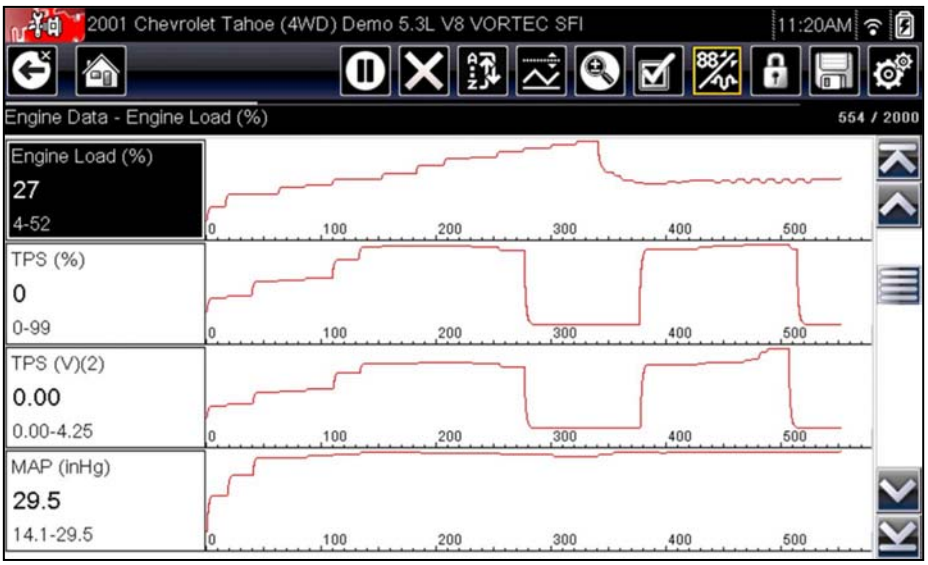


Figure 7-4 *High-contrast toolbar*

Selecting opens a menu with two choices; Color Toolbar and High Contrast Toolbar. Select and a “please wait” message displays followed by the Home screen. The new setting is now active.

Font Type

This option allows you to select between standard and bold faced type for the display screen. Bold type makes screen writing more legible under poor lighting or bright sunlight conditions.

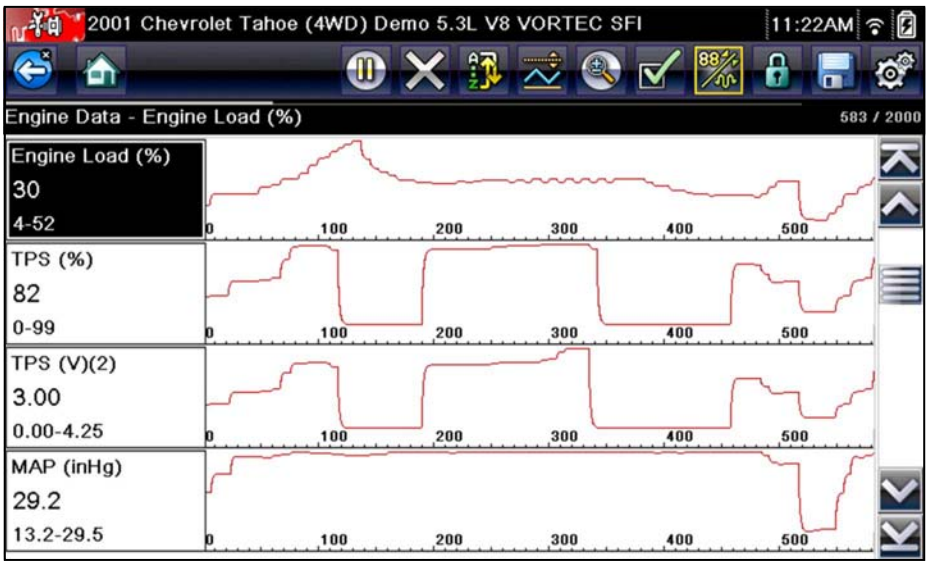


Figure 7-5 *Bold type on a black background*

Selecting opens a menu with two choices: Normal Font and Bold Font. Select a menu item or scroll and then press the **Y/✓** button to make a selection. The change is instantaneous. Select the Back or Home icon on the toolbar to return to either the Settings menu or the Home screen.

Backlight Time

This option allows you to configure how long the screen backlight remains on when the diagnostic tool is inactive. The following choices are available:

- Always On
- 15 Seconds
- 30 Seconds
- 45 Seconds
- 60 Seconds

Select the menu item desired, or scroll and then press the **Y/✓** button to make a selection. Select **Back** or **Home** on the toolbar to return to either the Settings menu or the Home screen.

Touch Screen Calibration

Calibrating the touch screen maintains the accuracy of the touch-sensitive display.

IMPORTANT:
To avoid serious damage to the diagnostic tool, always complete the touch screen calibration sequence once it has begun. **Never turn off the diagnostic tool while a screen calibration is in process.**

To calibrate the touch screen:

1. Select **Tools** from the Home screen to open the menu.
2. Select **Settings** from the menu.
3. Select **Touch Calibration** from the menu.
   The calibration screen opens (Figure 7-6).

Figure 7-6 *Touch screen calibration*

4. Select each box on the screen as it displays.
   The display returns to the Settings menu once the screen calibration procedure is complete.

Time Zone

This option opens a menu of time zone settings. Scroll to highlight, then select the local time zone. The display returns to the Settings menu once a time zone is selected.

Clock Settings

This option opens a window for resetting the time on the real-time clock.

To set the clock:

1. Select **Tools** from the Home screen to open the menu.
2. Select **Settings** from the menu.
3. Select **Clock Settings** from the menu.
   A warning message briefly displays followed by the Clock Settings screen (Figure 7-7).

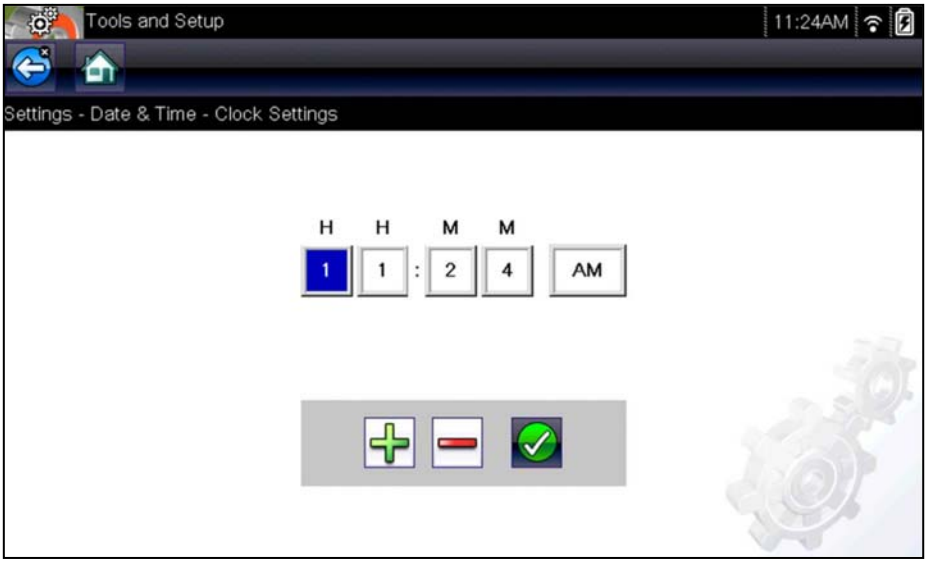


Figure 7-7 *Clock settings*

4. Select the **up** (**+**) icon on the screen or press the **up** (▲) button to incrementally increase the number in the highlighted field. Select the **down** (**–**) icon on the screen or press the down (▼) button to incrementally decrease the number.
5. Select the **check** (✓) icon on the screen or press the **Y/**✓ button to move the highlight to the next field.
6. Repeat Step 4 and Step 5 until the correct time is displayed.
7. Select the **Back** icon on the toolbar or press the **N/X** button to close the Clock Settings window and return to the Settings menu.

Daylight Savings Time

This option opens a menu to configure the internal clock for Daylight Savings Time. Choose from:

- **ON**—sets the clock for Daylight Savings time.
- **OFF**—sets the clock for standard time.

Make either selection, then select the **Back** icon or press the **N/X** button to return to the menu.

Time Format

This option determines whether time is displayed on a 12 or 24 hour clock. Selecting opens a menu with two choices:

- **24 Hour Format**
- **12 Hour Format**

Make either selection, then select the **Back** icon or press the **N/X** button to return to the menu.

Date Format

This option allows you to select how date information is displayed. Select from:

- **(MM_DD_YYYY)**—Month, Day, Year
- **(DD_MM_YYYY)**—Day, Month, Year
- **(YYYY_MM_DD)**—Year, Month, Day

Make a selection, then select the **Back** icon or press the **N/X** button to return to the menu.

Configuring Scanner

This option allows you to change the scanner display to toggle scales on and off. Scales are the graduations and values that display on the horizontal axis at the base of the parameter graphs. The waveform fills the entire graph area with scales switched off.

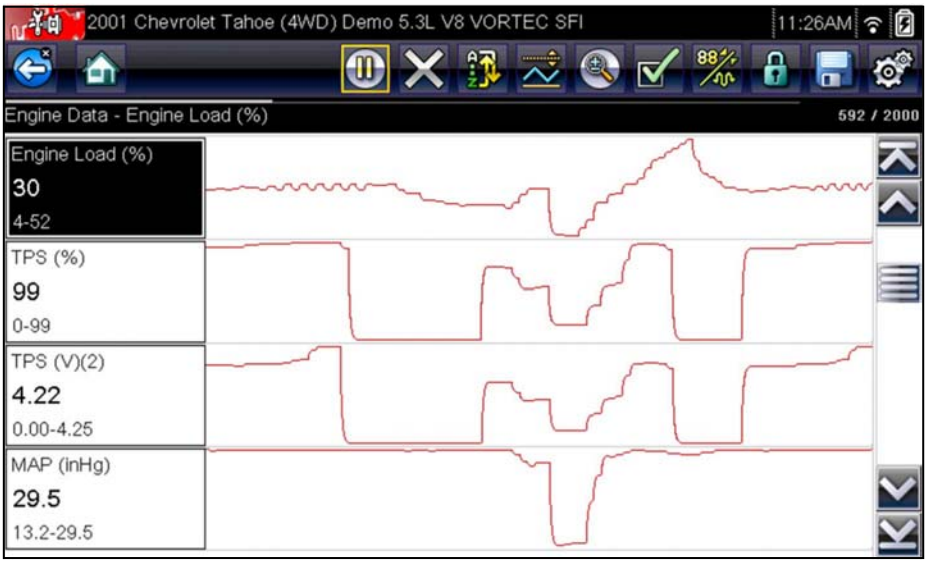


Figure 7-8 *Scales hidden*

To change hide/show scales:

1. Select **Tools** from the Home screen.
2. Select **Settings** from the Tools and Setup menu.
3. Select **Configure Scanner** from the Settings menu.
4. Highlight either menu entry to make a selection:
   - **Show Graph Scale**—to switch the scales on.
   - **Hide Graph Scale**—to switch the scales off.
5. Select the **Back** icon or press the **N/X** button to return to the Settings menu.

Configure Units

Selecting opens a dialog box that allows you to choose between US customary or metric units of measure for temperature, vehicle speed, air pressure, and other pressures.

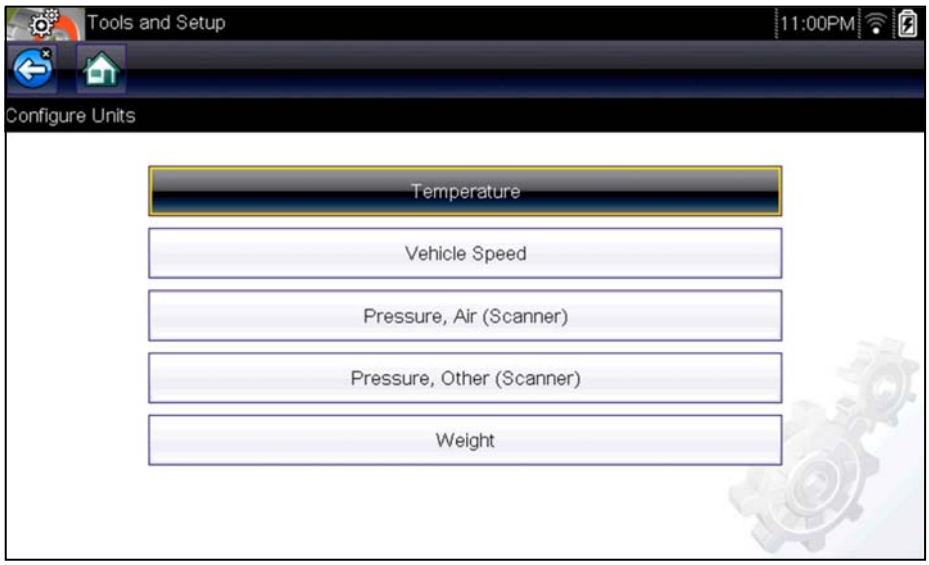


Figure 7-9 *Configure units menu*

To change the units setup:

1. Select **Tools** from the Home screen to open the menu.
2. Select **Configure Units** to open the menu.
3. Select an item from the Configure Units menu.
4. Select a setting from the listed choices.
5. Select **Back** on the toolbar or press the **N/X** button to return to the options menu.

Chapter 8 Maintenance

This chapter describes basic cleaning and battery replacement procedures for your diagnostic tool.

8.1 Cleaning and Inspecting the Diagnostic Tool

Periodically perform the following tasks to keep your diagnostic tool in proper working order:

- Check the housing, cables and connectors for dirt and damage before and after each use.
- At the end of each work day, wipe the diagnostic tool housing, cables and connectors clean with a damp cloth.

IMPORTANT:
Do not use any abrasive cleansers or automotive chemicals on the unit.

8.1.1 Cleaning the Touch Screen

The touch screen can be cleaned with a soft cloth and a mild window cleaner.

IMPORTANT:
Do not use any abrasive cleansers or automotive chemicals on the touch screen.

8.2 Battery Pack Service

Follow all safety guidelines when handling the battery pack.

⚠ WARNING

Risk of electric shock.

- **Prior to recycling the battery pack, protect exposed terminals with heavy insulating tape to prevent shorting.**
- **Disconnect all test leads and turn diagnostic tools off before removing the battery pack.**
- **Do not attempt to disassemble the battery pack or remove any component projecting from or protecting the battery terminals.**
- **Do not expose the unit or battery pack to rain, snow, or wet conditions.**
- **Do not short circuit the battery terminals.**

Electric shock can cause injury.

⚠ WARNING

Risk of explosion.

- **Use the proper factory battery pack only, incorrect replacement or tampering with the battery pack may cause an explosion.**

Explosion can cause death or serious injury.

8.2.1 Battery Pack Safety Guidelines

IMPORTANT:
The battery pack contains no user serviceable components. Tampering with the battery pack terminals or housing will void the product warranty.

Keep the following in mind when using and handling the battery pack:

- Do not short circuit battery terminals.
- Do not immerse the diagnostic tool or battery pack in water, or allow water to enter the unit or battery compartment.
- Do not crush, disassemble, or tamper with the battery pack.
- Do not heat the battery pack to over 100°C (212°F), or dispose of it in a fire.
- Do not expose the battery pack to excessive physical shock or vibration.
- Keep the battery pack out of reach of children.
- Do not use a battery pack that appears to have suffered abuse or damage.
- Store the battery pack in a cool, dry, well ventilated area.

NOTE:
The battery pack should be used within a short period of time (about 30 days) after charging to prevent loss of capacity due to self-discharging.

If long-term storage of the battery pack is necessary, it should be stored in a in cool, dry, well ventilated place with a 30 to 75 percent state of charge to prevent loss of characteristics.

To prolong the life of your battery, power off the unit when not in use. The diagnostic tool has a built in charger that recharges the battery on demand whenever it is connected to a power source.

8.2.2 Replacing the Battery Pack

If the battery pack no longer holds a charge, contact your sales representative to order a new one.

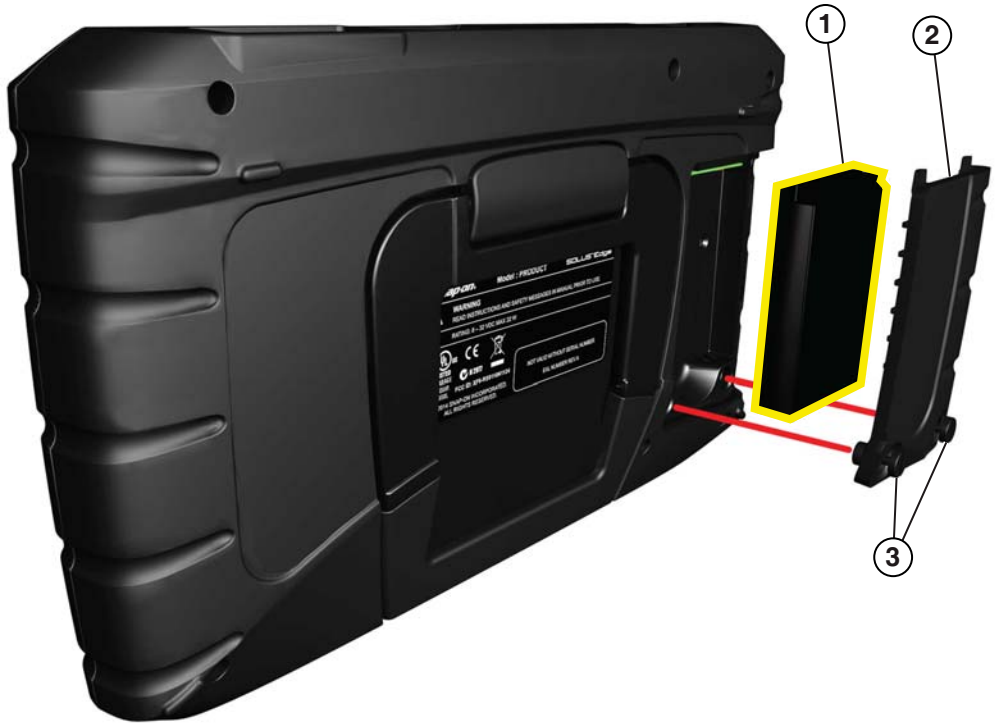
IMPORTANT:
Replace the battery pack with original Snap-on replacement parts only.

To replace the battery pack:

1. Loosen the two screws that retain the battery compartment cover.
2. Lift the lower edge of the battery compartment cover and slide it down slightly to clear the locating tabs and remove the cover.
3. Lift the lower edge of the battery and slide it down slightly to clear the locating tabs and remove the battery.

IMPORTANT:
During installation, do not overtighten the battery cover screws.

4. To install the new battery, reverse the removal procedures.



1— Battery
2— Battery Cover
3— Battery Cover Screws

Figure 8-1 *Battery pack location*

8.2.3 Disposing of the Battery Pack

Always dispose of the battery pack according to local regulations, which vary for different countries and regions. The battery pack, while non-hazardous waste, does contain recyclable materials. If shipping is required, ship the battery pack to a recycling facility in accordance with local, national, and international regulations. For additional information contact:

- North America—Rechargeable Battery Recycling Corporation (RBRC) at http://www.rbrc.org or http://www.call2recycle.org, or call 1(800) 822-8837 (USA)
- United Kingdom—Electrical Waste Recycling Company at http://www.electricalwaste.com

Products bearing the WEEE logo (Figure 8-2) are subject to European Union regulations.

Figure 8-2 *sample WEEE logo*

NOTE:
Always dispose of materials according to local regulations.

Contact your sales representative for details.

Index

A

AC/DC power supply 8
Actuator tests 23

B

Battery 8
  Disposal 76
  Handling 74
  Recycling 76
  Replacing 75
Battery replacement 73
Battery service 73–76
Brightness, adjusting 66
Buttons
  Control 5, 6

C

Changing screen views 29
Checking codes 51
Cleaning 73
Clear codes 23, 52
Clearing codes 26
Codes menu 23
Codes. *See* Diagnostic trouble codes (DTCs)
Common Replaced Parts graph 41
Communication protocol 59
Configure units 72
Connecting to a vehicle 17, 20
Connector Information 58
Connect-to-PC 64

D

Data display 23
Data parameters
  Displaying 23
Demonstration program 19, 20
Diagnostic connector 58
  Location 58
Diagnostic trouble codes (DTCs) 23
Directional buttons 6
DTC status 27

E

Emergency shutdown 11

F

Fast-Track Troubleshooter 23, 55
Freeze Frame/Failure Records 26
Functional description 7
Functional tests 23, 35

G

Generic functions 23

H

Home screen 13

I

Identifying a test vehicle 20
Information tests 35

L

Locking parameters 30

M

Manual conventions
  Description 3
  Notes 4
Memory resets 23
Messages
  Screen 16

O

OBD Diagnose 53, 58
OBD Health Check 51, 53
Operations
  Connecting to a vehicle 17, 20
  Identifying a test vehicle 20
  Selecting a system to test 20
  Selecting tests 20

P

Parameters. See Data parameters
Pausing data 25, 33
Pending codes 52
PID trigger
  set levels 32
PIDs. *See* Data parameters
Power sources 8
  AC/DC power supply 8
Powering off 10, 11, 59

Powering on 10

R

Readiness monitors 52
Reset tests 35

S

Safety ii
Saved vehicle data 61
Saving 34
Scan Module
  Troubleshooter 55
Scanner 18
  Actuator tests 23
  Clear codes 23, 26
  Codes menu 23, 26, 28
  Communication protocol 59
  Connecting 17
  Custom data list 29
  Data display 31
  Demonstration program 19, 20
  Exiting 38
  Functional tests 23, 35
  Generic functions 23, 50, 59
  Memory resets 23
  OBDII testing 50, 59
  Readiness monitors 53
  System selecting 20
  System tests 23
  Title bar 12
  Troubleshooter 23, 36, 37, 55
  Vehicle ID 20
Screen layout
  Scanner 15, 18
Screen messages 16
Selecting a system to test 20
Selecting tests 20
Shortcut button
  Configuring 64
software
  Troubleshooter 37
Specifications 9
SureTrack 38
SureTrack dashboard 40
SureTrack Status Messages 40
SureTrack Troubleshooting 47
System Information 65
System tests 23

T

Tests
  Actuator 23
  Functional 23
  functional 35
  Selecting 20
  System 23
Time settings 69, 71
Title bar 12
Toggle tests 35
Tool settings 65, 68
Tool setup options 63, 72
Touch Screen
  Calibrating 69
  viewing options 67, 68
Touch screen calibration 73
trigger. *See* PID trigger
Trouble codes. *See* Diagnostic trouble codes (DTCs)
Troubleshooter 23, 36, 37, 55
Troubleshooter software. *See* software

V

Variable control tests 35
Vehicle history 61

W

Wi-Fi Setup 43
Wi-Fi Testing 44